

# Social cost of abolishing Japanese Employee's Pension Fund

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# Profile

**Takahiro Tachimoto** (Taka), F.I.A.J

Takahiro Tachimoto majored in physics, and completed his Master's Degree in 2011. During his Masters, he specialized **quantum information** and studied why the natural law can be described by quantum theory.

Subsequently, he entered **Nippon Life Insurance Company** and was assigned to Group Annuity Dept., engaged in premium calculation and financial verification of private pension funds.

He is a Fellow of the Institute of Actuaries of Japan (F.I.A.J).

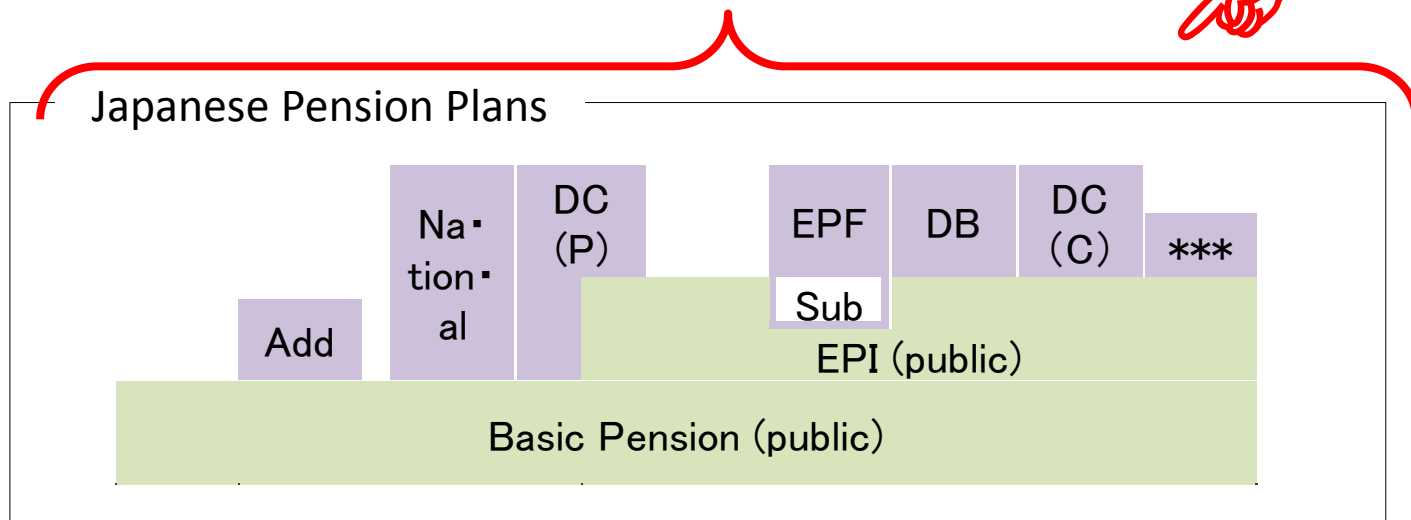


# Overview of Presentation

1. Introduction of Japanese pension plans.
2. Description of Employee's Pension Fund (EPF).
3. Contents of a law revision on EPF in 2014.
4. Influence of the law revision on public pensions.
5. Conclusion and further discussions.

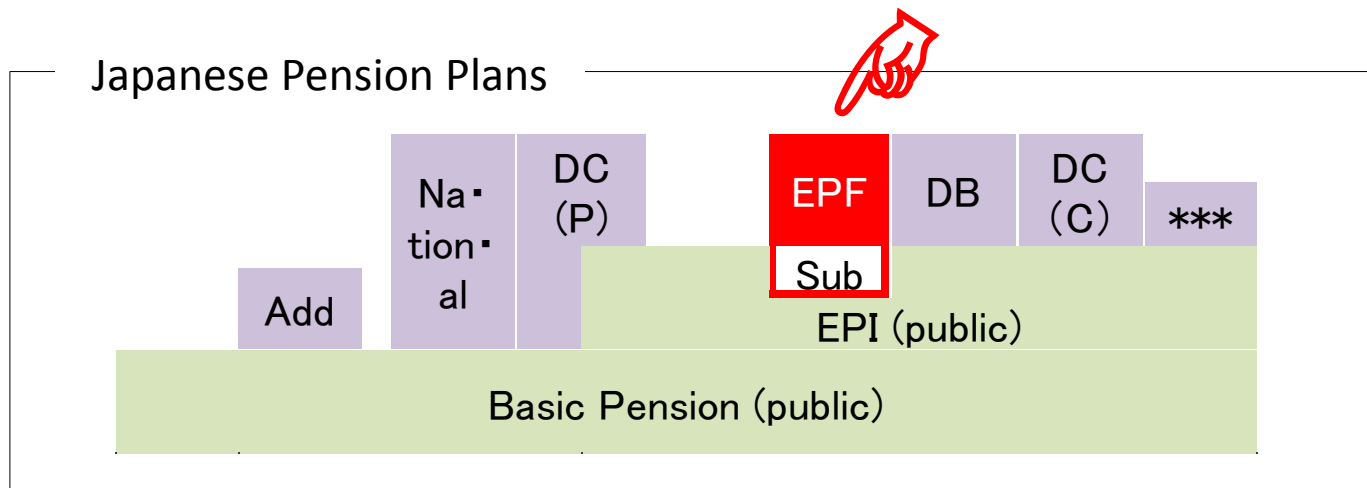
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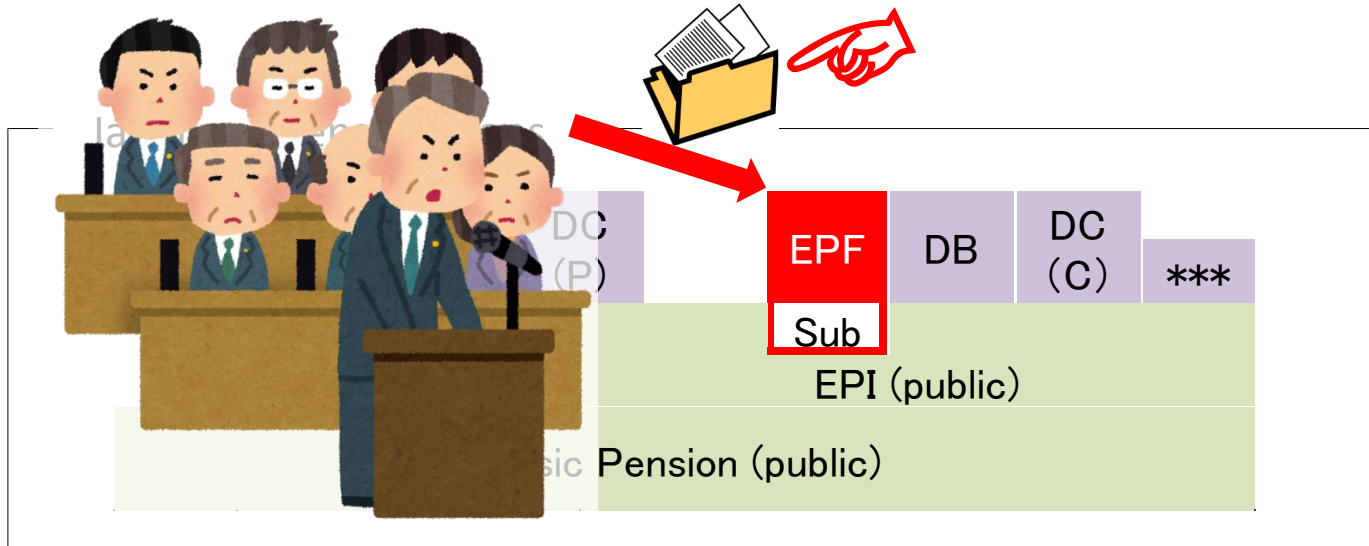
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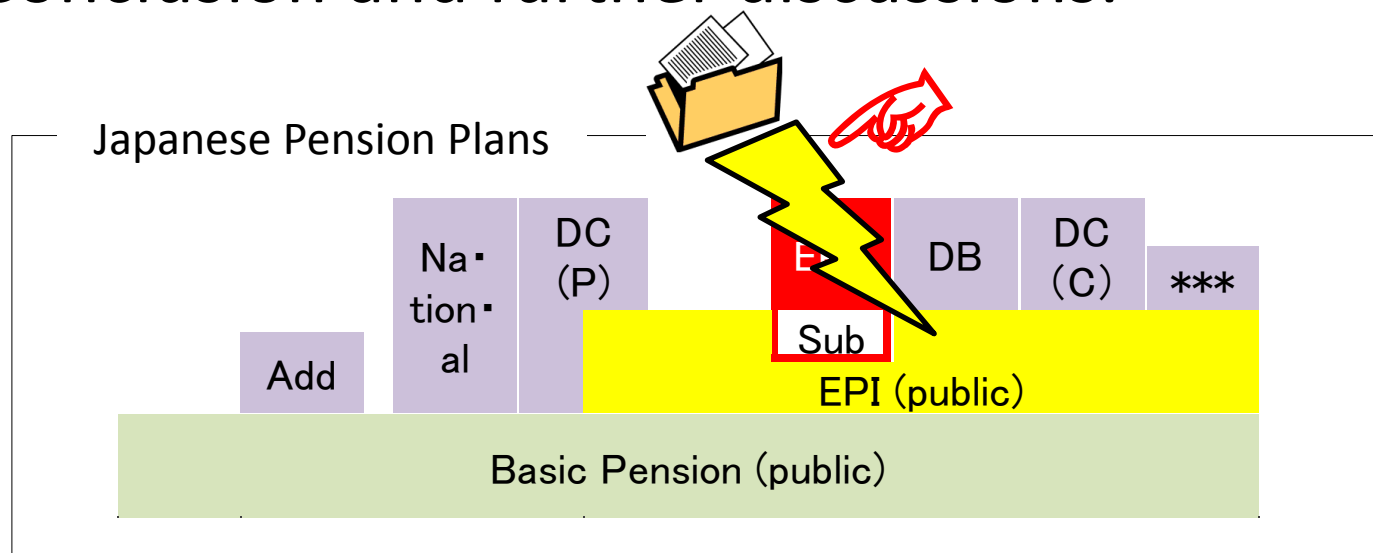
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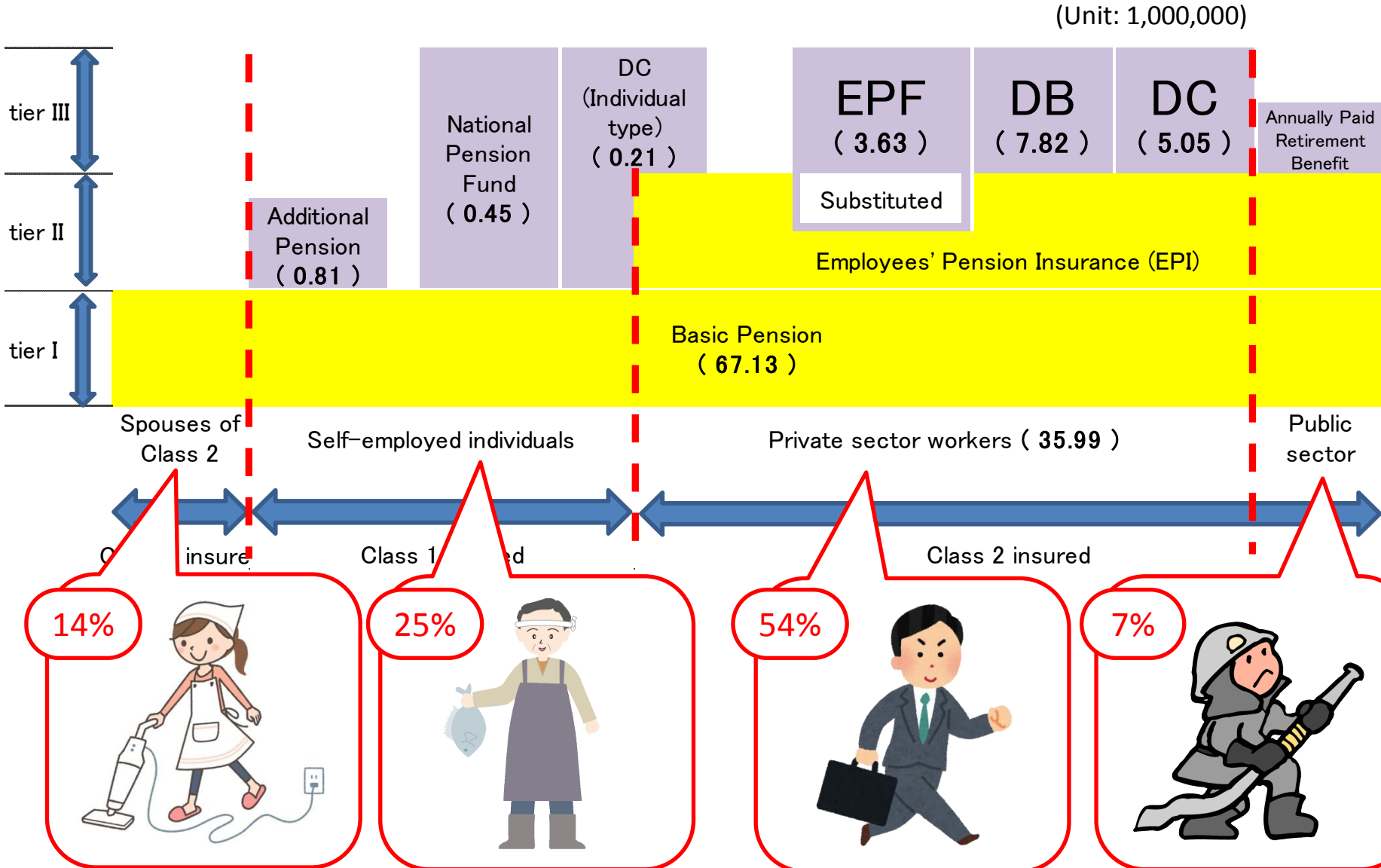
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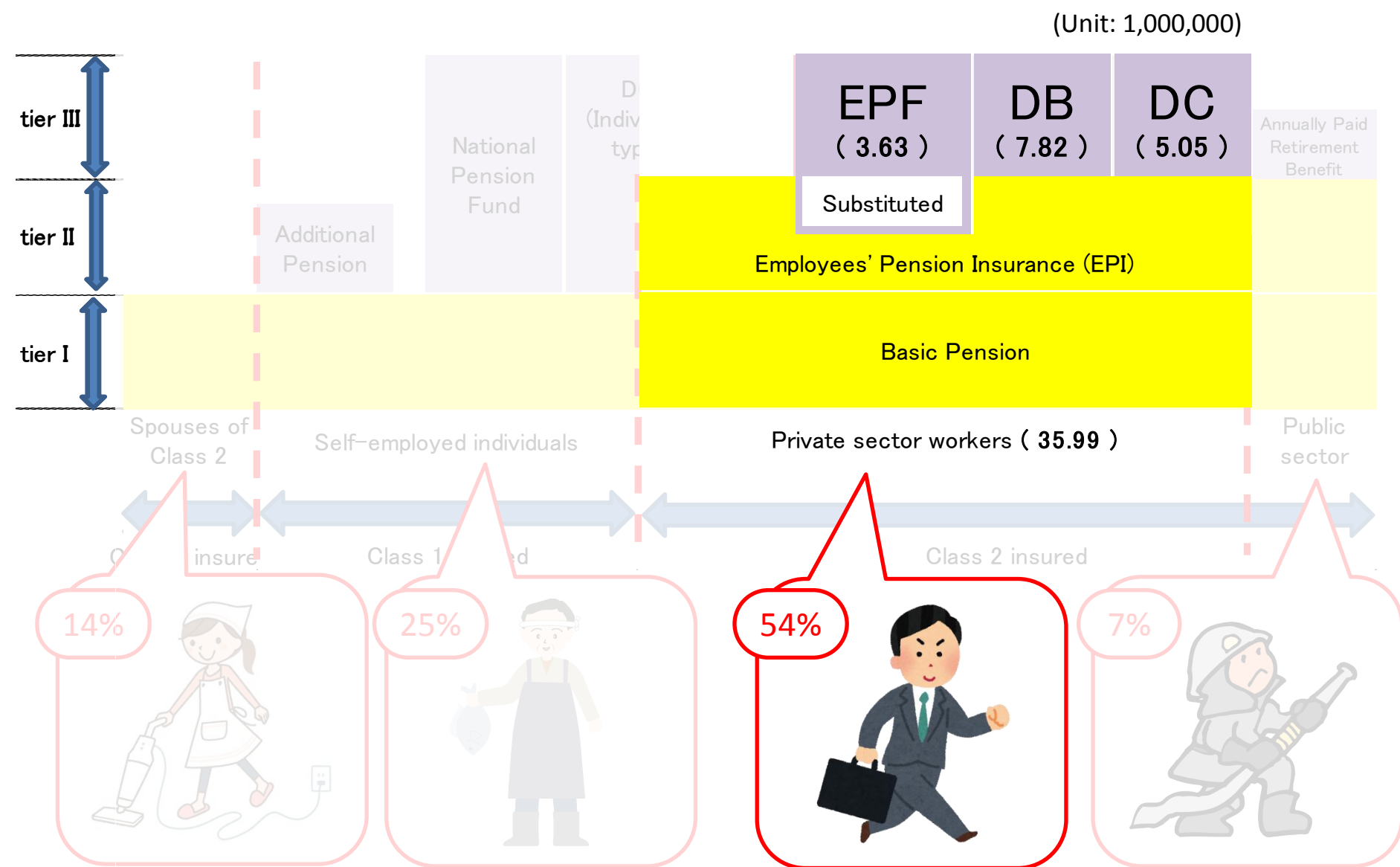


# 1. Introduction of Japanese pension plans.

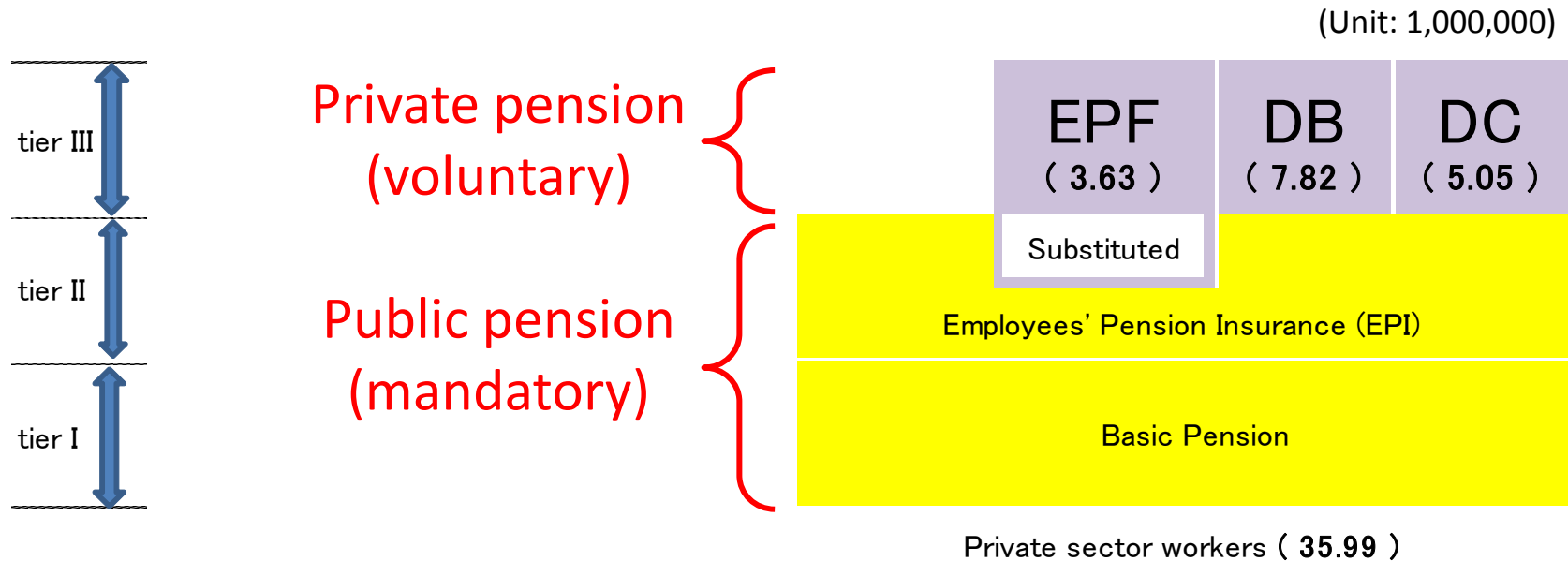
# Japanese pensions overview




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# Japanese pensions overview



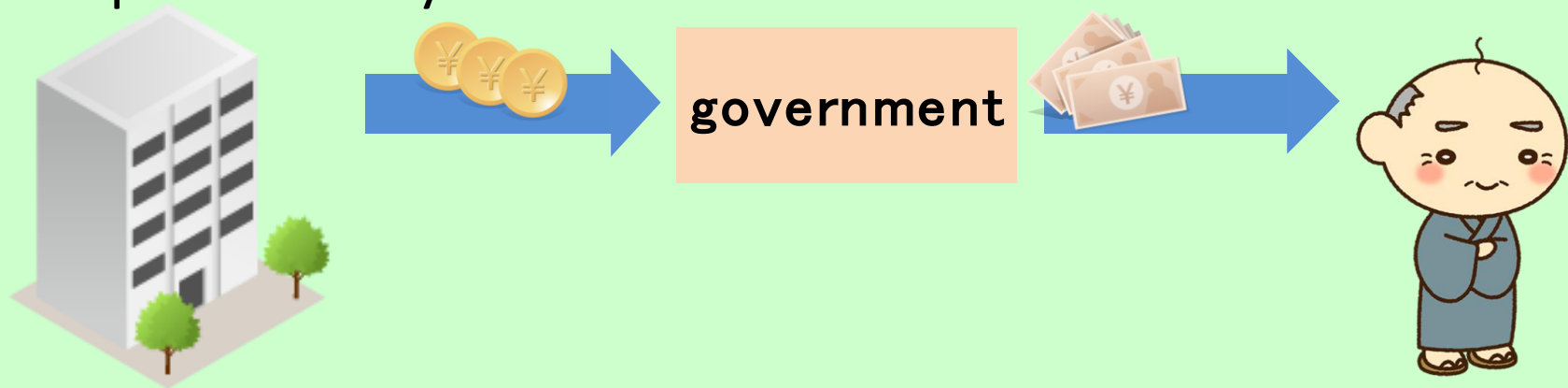
DB type { EPF : Employee's Pension Fund   
DB : Defined Benefit Plan

DC type - DC : Defined Contribution Plan  
(company type)

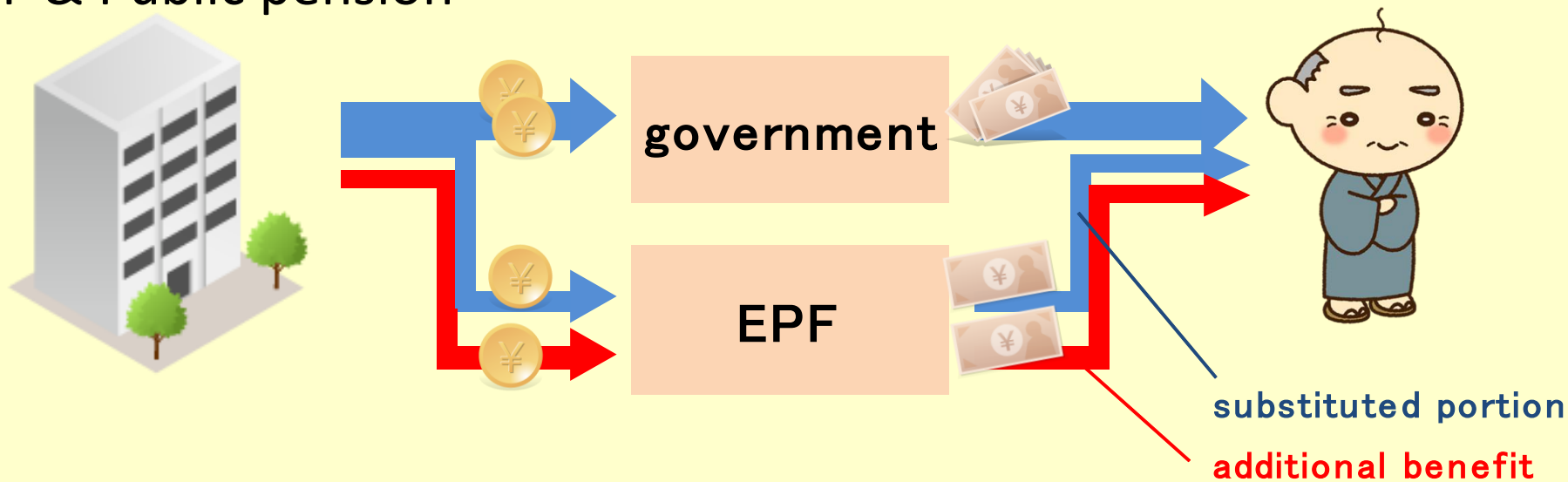
## 2. Description of Employee's Pension Fund (EPF).

# EPF scheme

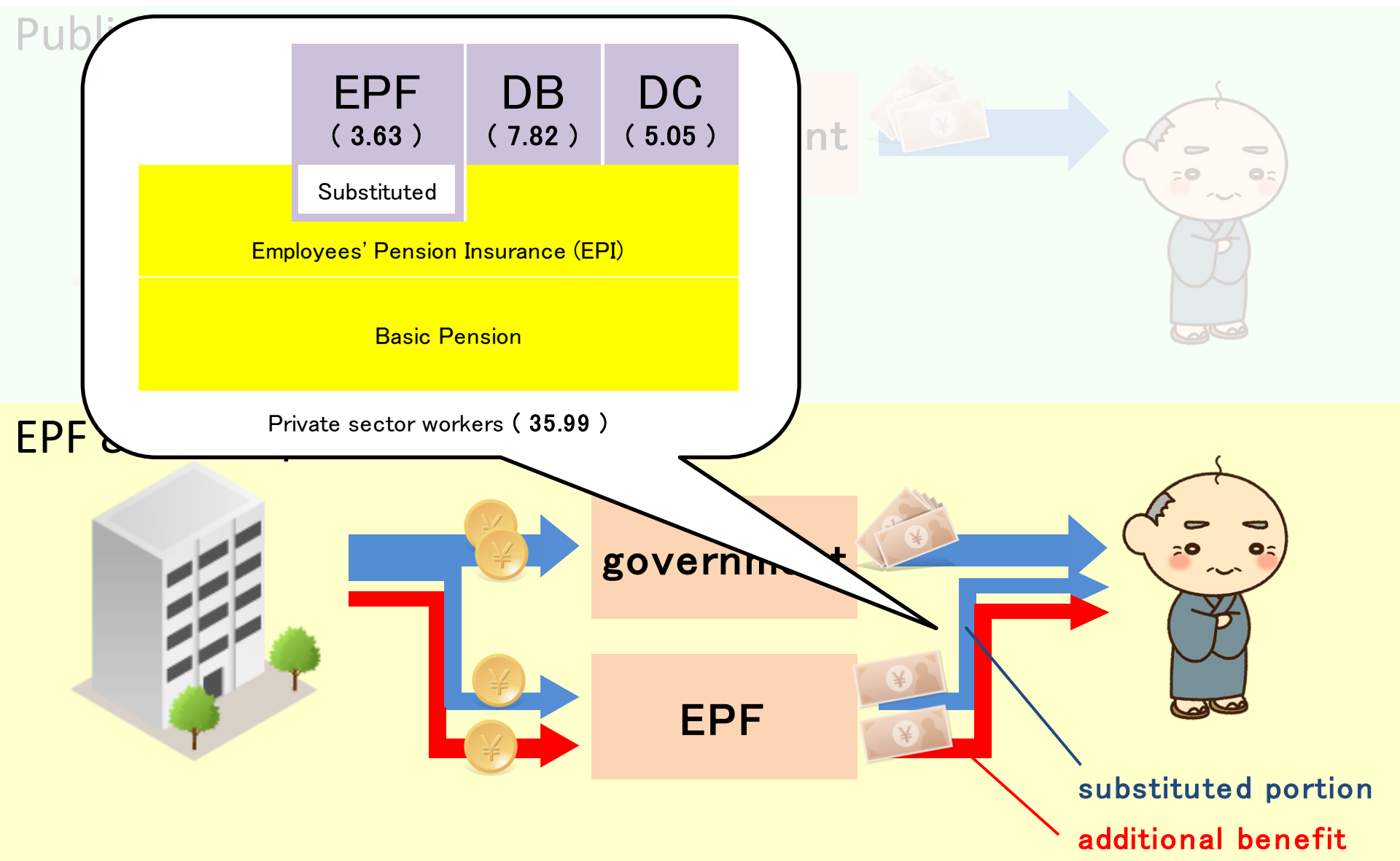
## Public pension only



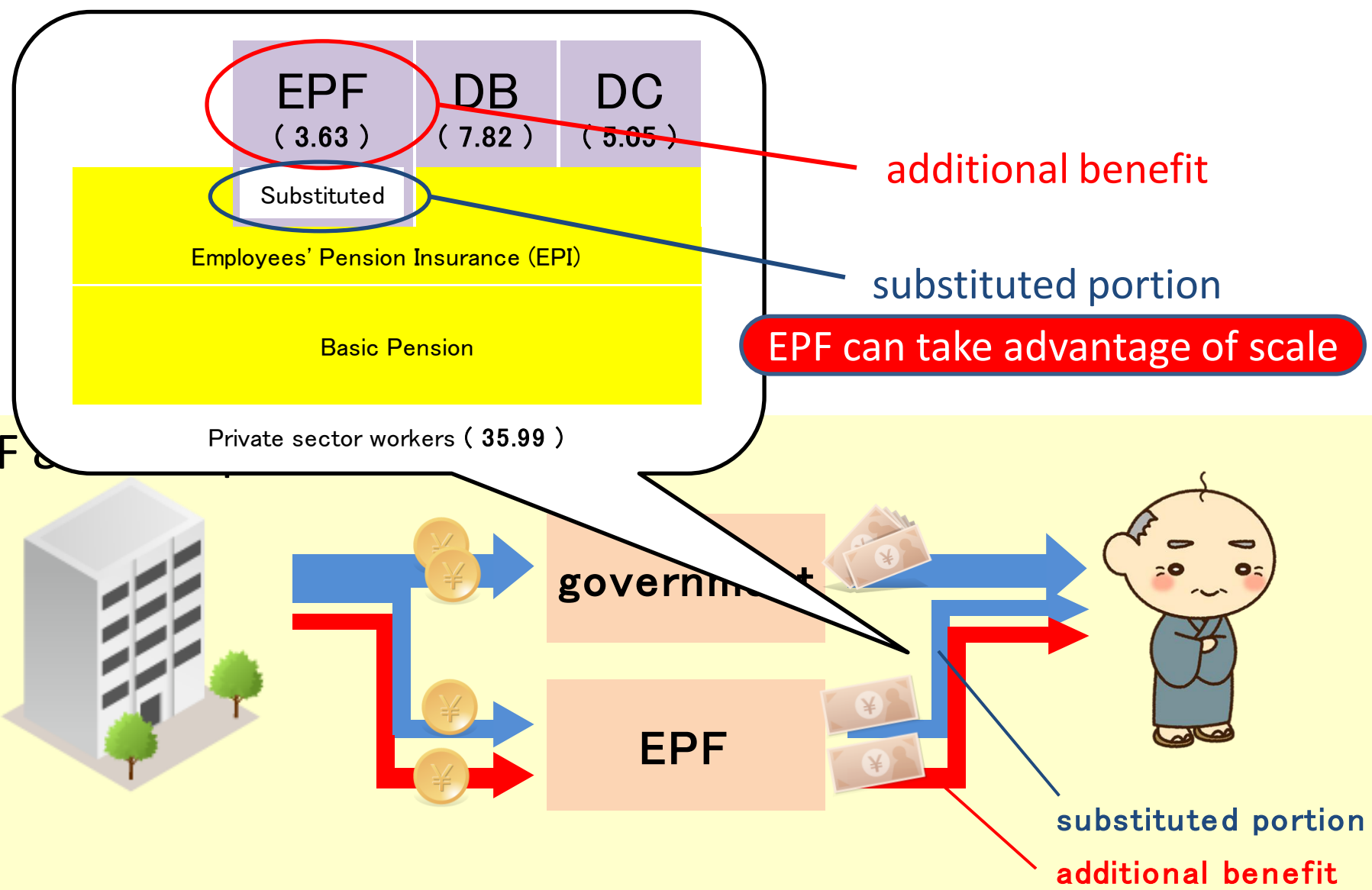
## EPF & Public pension



# EPF scheme

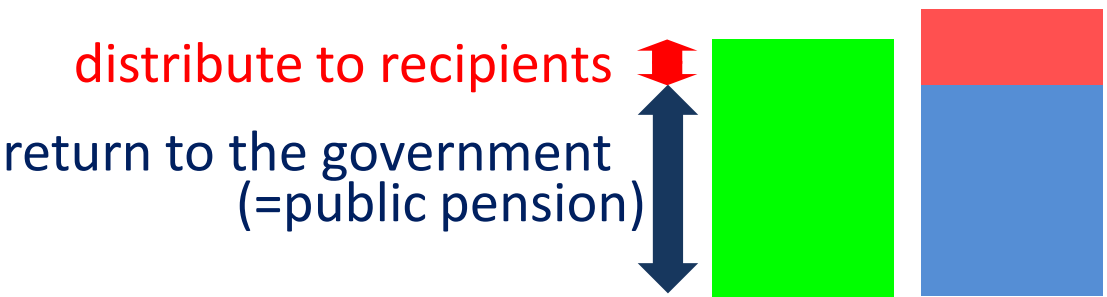
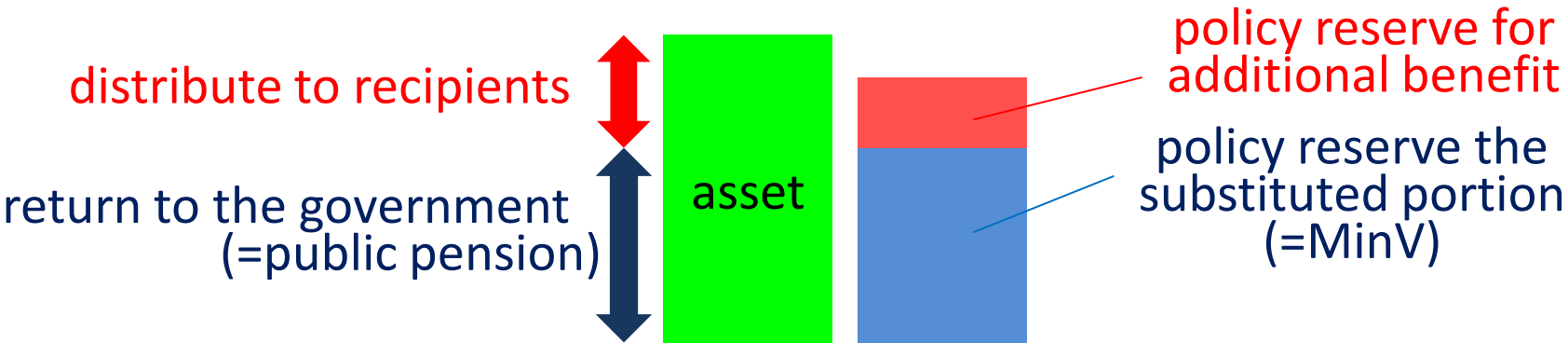


# EPF scheme

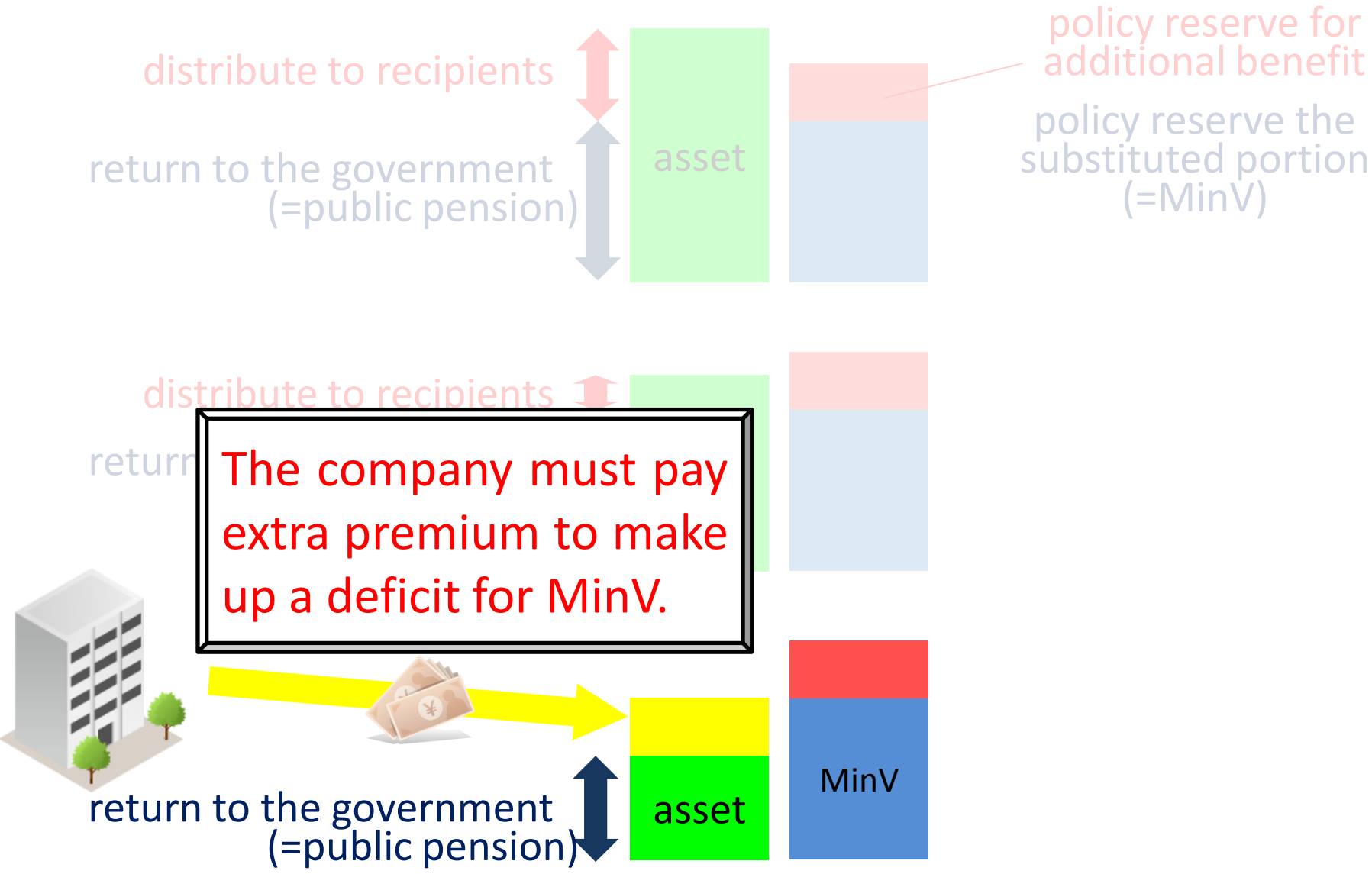




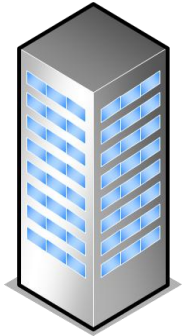
# What occurs if EPF is terminated?



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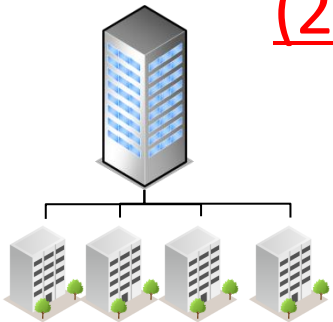


# Three types of EPF



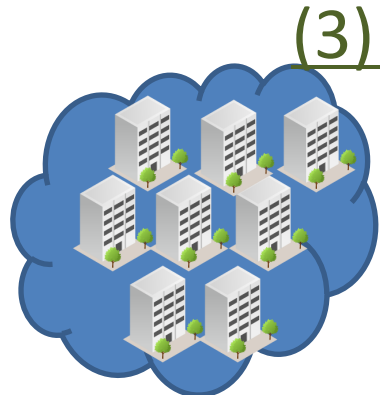
## (1) Independent type

- established independently by a (usually large) company.



## (2) Joint type

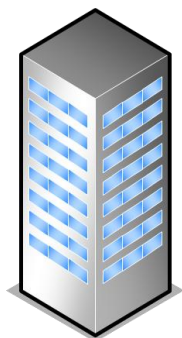
- established jointly by affiliated companies (e.g., a parent company and its subsidiaries.)



## (3) General type

- established by a large number of companies (most of which are SMEs) in the same business field or the same region.

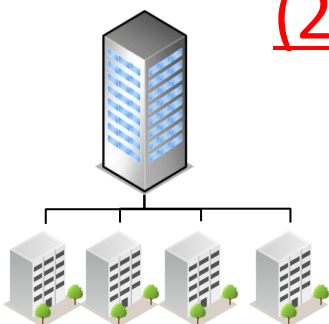
# Three types of EPF



## (1) Independent type

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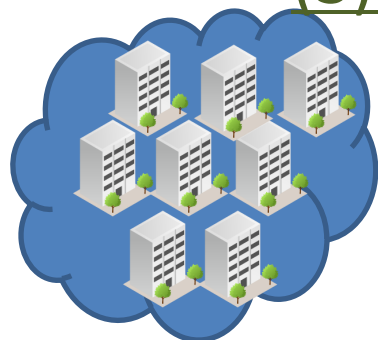
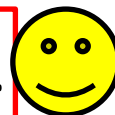
Possess plenty of money.



## (2) Joint type

- established jointly by affiliated companies (e.g., a parent company and its subsidiaries.)

Decision-making is quick.



## (3) General type

- established by a large number of companies in the same business field or the same region.

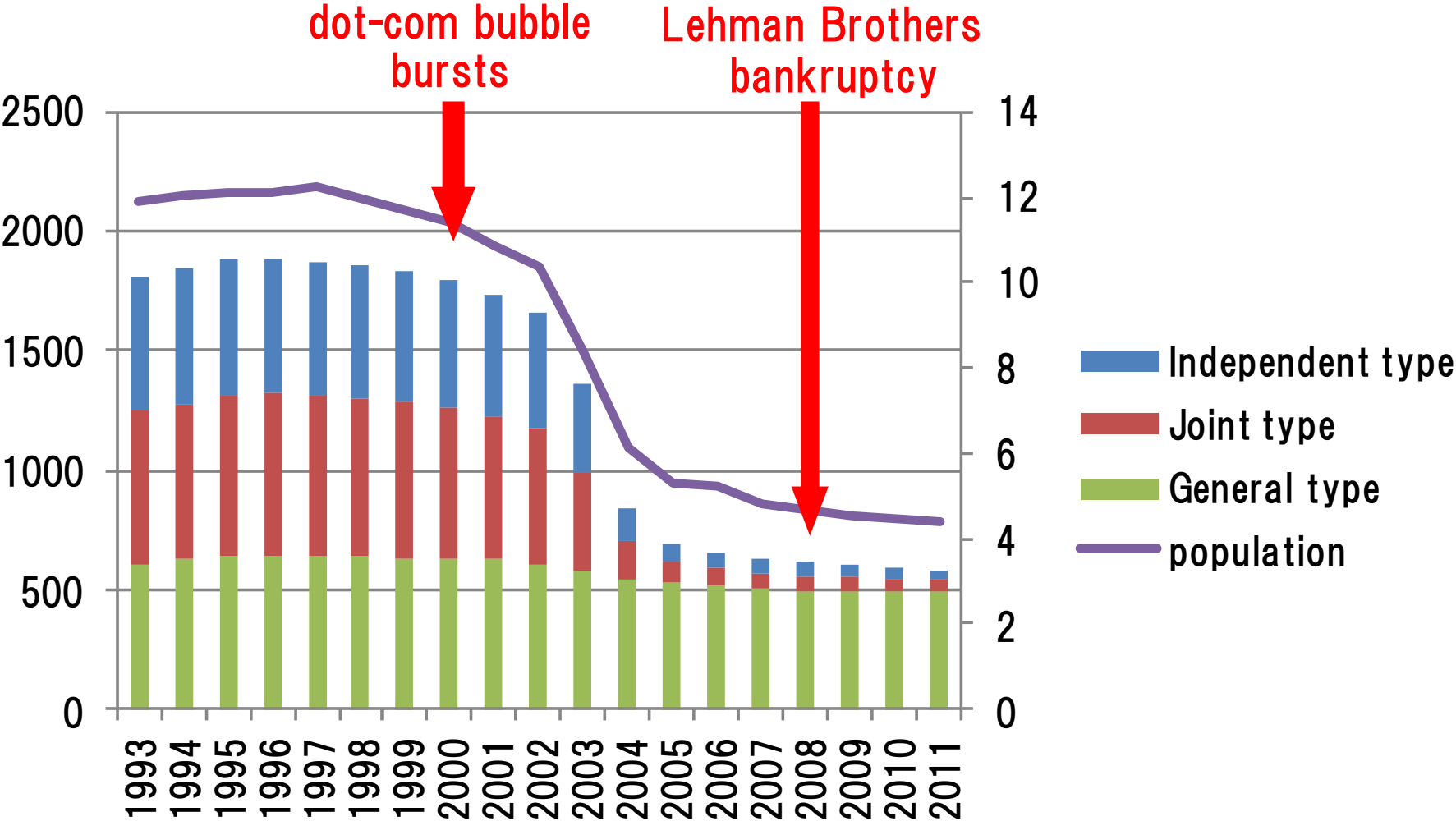
Cannot afford much money.



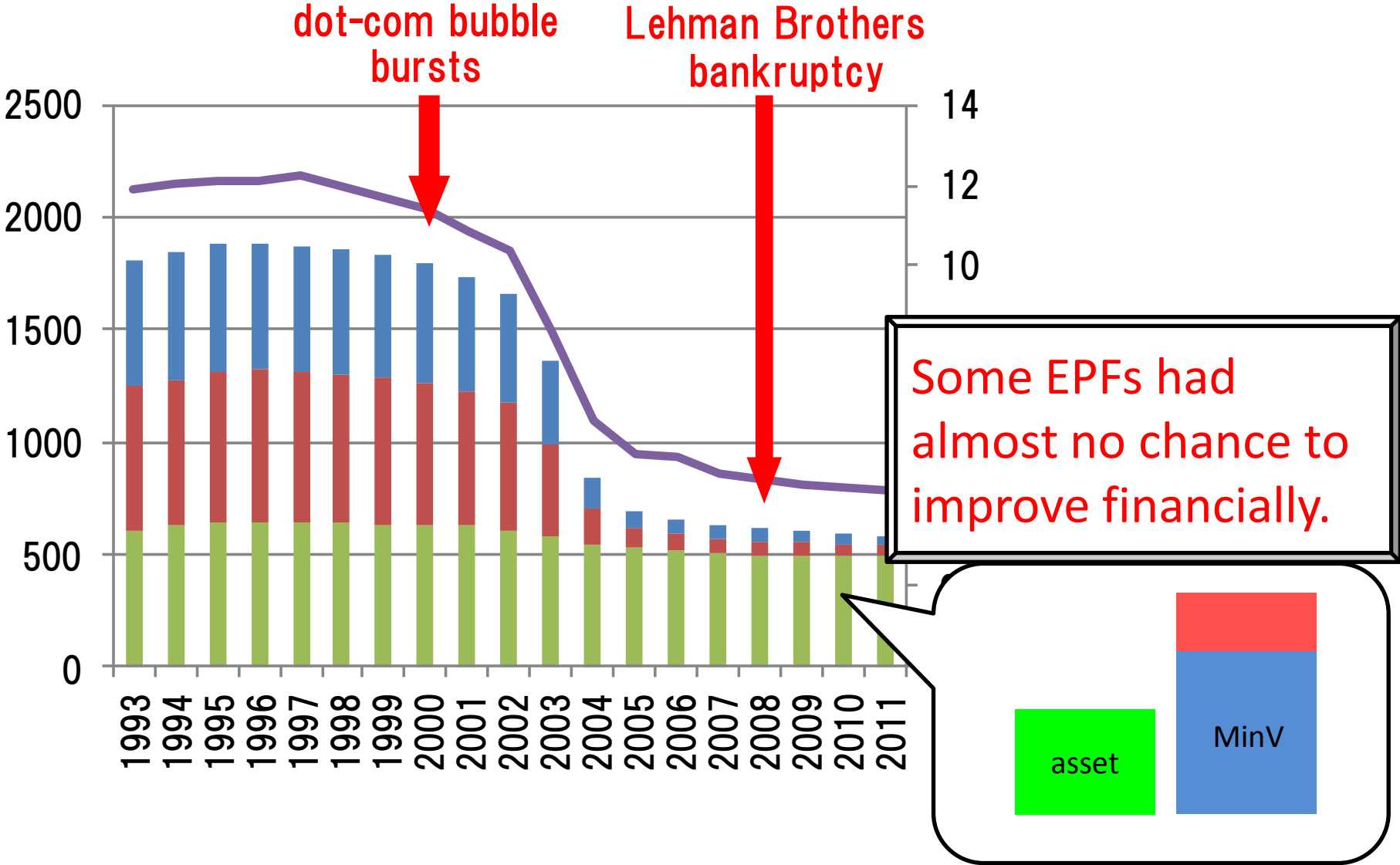
Hard to reach agreement



# Changes of the number of EPFs

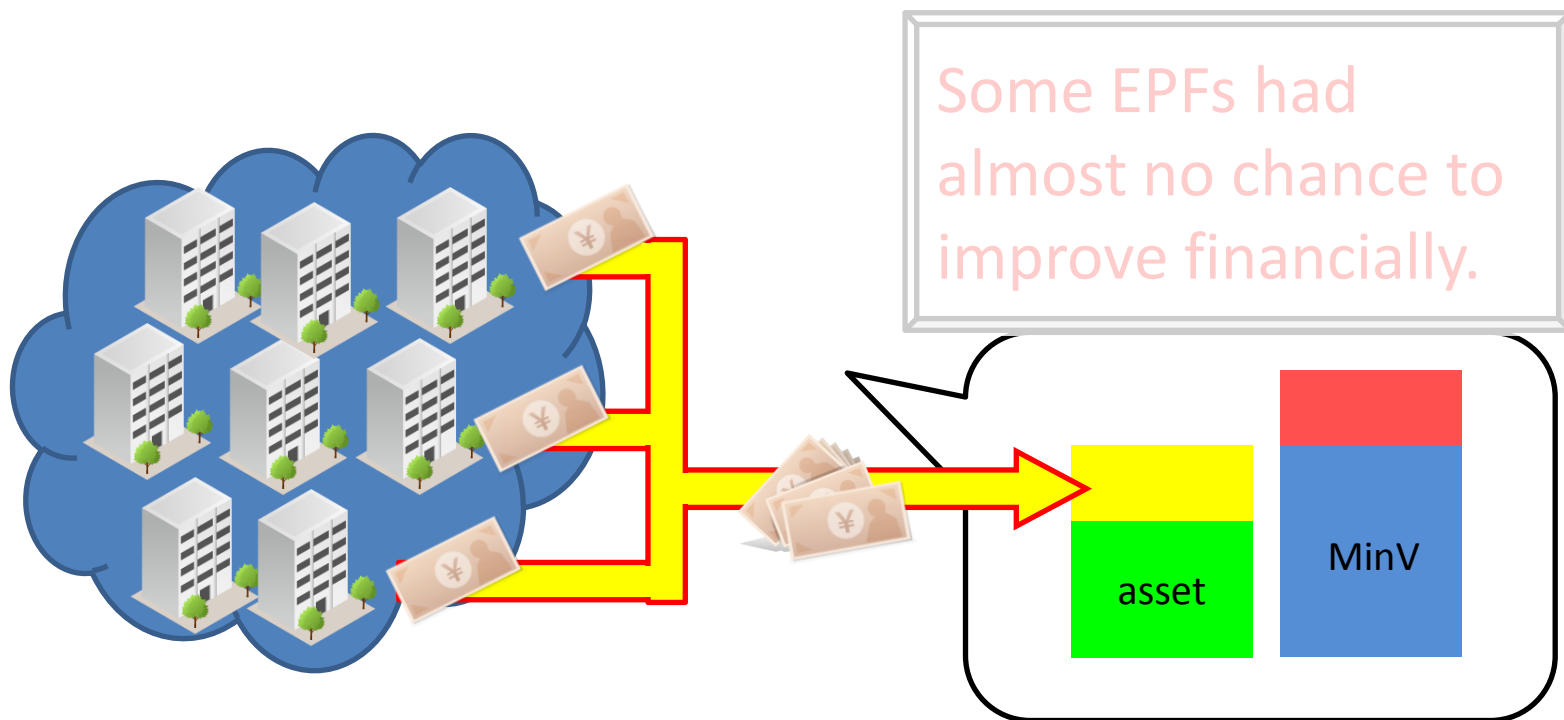


# Changes of the number of EPFs



# Who has to make up the deficit?

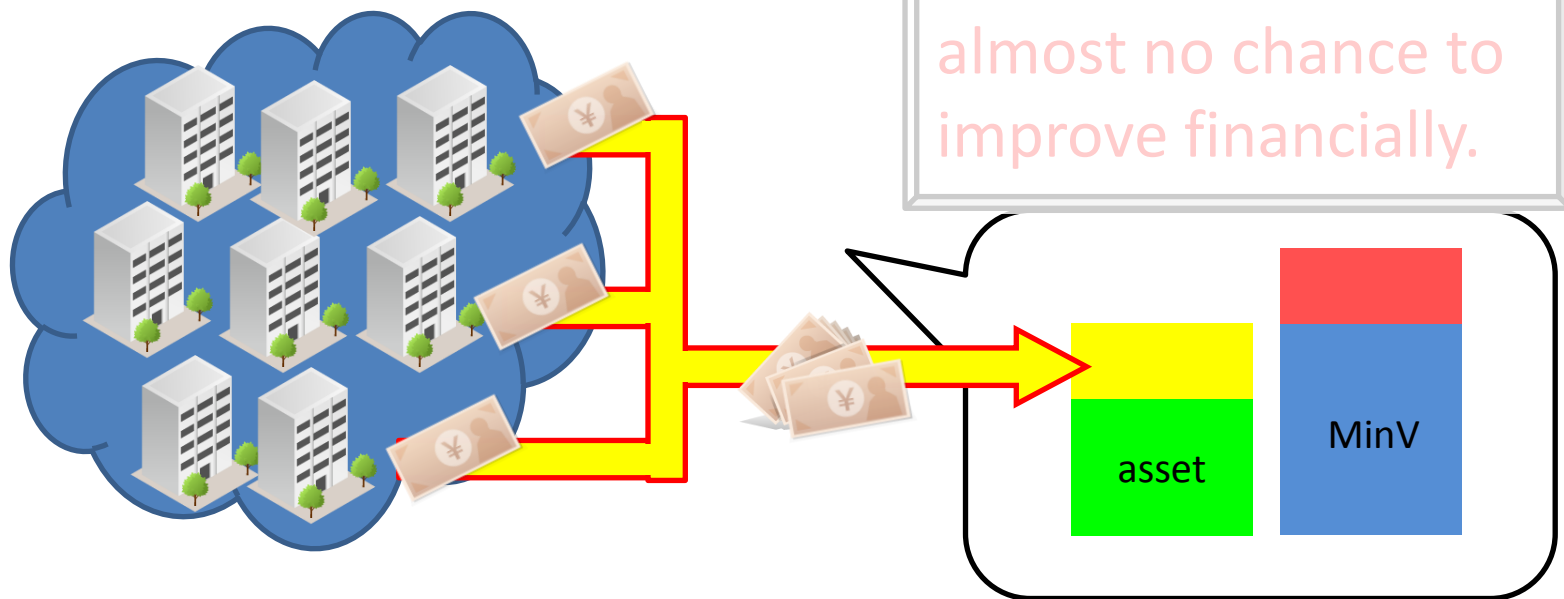
Benefit for the substituted portion must neither be reduced nor suspended.



# Who has to make up the deficit?

Benefit for the substituted portion must neither be reduced nor suspended.

Each company has prime responsibility for making up the deficit for MinV.





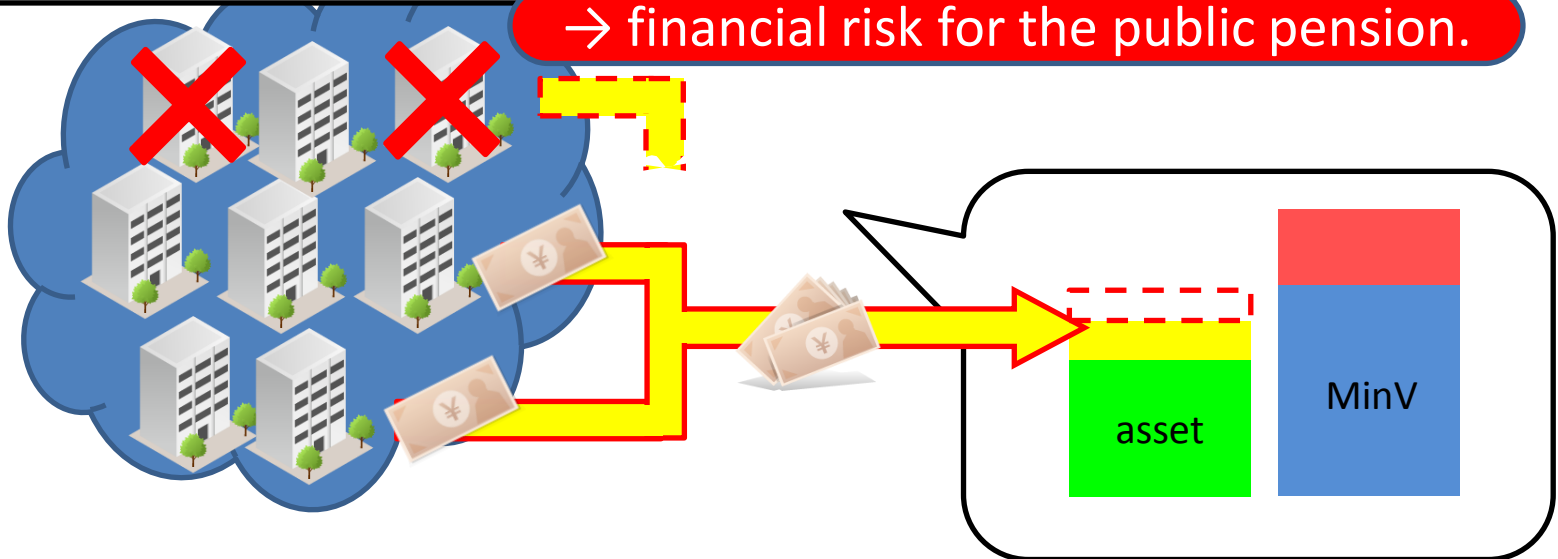
# Who has to make up the deficit?

Benefit for the substituted portion must neither be reduced nor suspended.

Each company has prime responsibility for making up the deficit for MinV.

But when bankruptcy, it is usually hard to pay all amount of their debts.

→ financial risk for the public pension.



# 3. Contents of a law revision on EPF in 2014.

# Dilemma

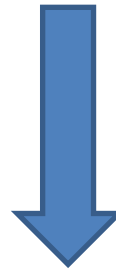
EPF is a financial risk for the public pension.

compulsive termination?



Companies have to make up a deficit for MinV.  
Extra premium is too much to pay for small companies.

reduction of the debt?  
injection of public funds?



It is hard to give satisfactory explanations to taxpayers.  
(It is absurd since most citizens are unrelated to EPF.)

# Contents of the law revision on EPF

1. No new establishment of EPF is approved (since April 2014).
2. The formula to calculate MinV is renewed.  
(The previous formula can also be used until April 2019.)
3. Deficit of reserve may be paid by installments.  
(Limited to EPFs which is terminated by April 2019.)
4. The government will issue an order to terminate EPF  
whenever  $asset < MinV \times 1.5$  (after April 2019.)
5. The government supports establishment of succeeding  
pension plans, such as DB and DC. (by April 2019.)

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whenever  $asset < MinV \times 1.5$  (**after April 2019.**)  
Only 10% fulfilled condition (4) in March, 2012
5. The government supports establishment of succeeding  
pension plans, such as DB and DC. (**by April 2019.**)

All EPFs are motivated to be terminated by April 2019.

**The law revision is virtually EPF abolishment (=terminating All EPFs).**

# Contents of the law revision on EPF

2. The formula to calculate MinV is renewed.  
(The previous formula can also be used **until April 2019.**)

on the surface

just a mathematical improvement.

but

the real purpose

reduction of the debt

- ✓ Both  $\text{MinV}_{\text{old}}$  and  $\text{MinV}_{\text{new}}$  can be used.
- ✓ The debts decreases :  $\text{MinV}_{\text{old}} \rightarrow \min\{ \text{MinV}_{\text{old}} , \text{MinV}_{\text{new}} \}$   
(**Indirect ways** to decrease the debt )

# Dilemma

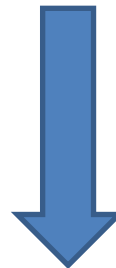
EPF is a financial risk for the public pension.

compulsive termination?



Companies have to make up a deficit for MinV.  
Extra premium is too much to pay for small companies.

reduction of the debt?  
injection of public funds?



It is hard to give satisfactory explanations to taxpayers.  
(It is absurd since most citizens are unrelated to EPF.)

# Solution for Dilemma

EPF is a financial risk for the public pension.

~~compulsive termination?~~

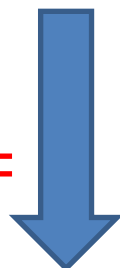


The law revision motivated EPFs to be terminated, but not compulsive.



Companies have to make up a deficit for MinV.  
Extra premium is too much to pay for small companies.

~~reduction of the debt?~~  
~~injection of public funds?~~



Yes, the debt was virtually reduced, but in an indirect way.



It is hard to give satisfactory explanations to taxpayers.  
(It is absurd since most citizens are unrelated to EPF.)



# Solution for Dilemma

EPF is a financial risk for the public pension.

~~compulsive termination?~~

The law revision motivated EPFs to be terminated, but not compulsive. 😊

Companies have to make up a deficit for MinV.  
Extra premium is too much to pay for small companies.

reduction of the debt?

~~injection of public funds?~~

Yes, the debt was virtually reduced, but in an indirect way. 😊

quantified in Chapter 4

It is hard to give satisfactory explanations to taxpayers.  
(It is absurd since most citizens are unrelated to EPF.)

## 4. Influence of the law revision on public pensions.

# Quantifying social cost to abolish EPF

## phrases

social cost : expenditure of the government (or municipality)

abolish : do away with, get rid of

## in this context

The increase in net expenditure (as the present value) induced by the law revision to terminate all EPFs.

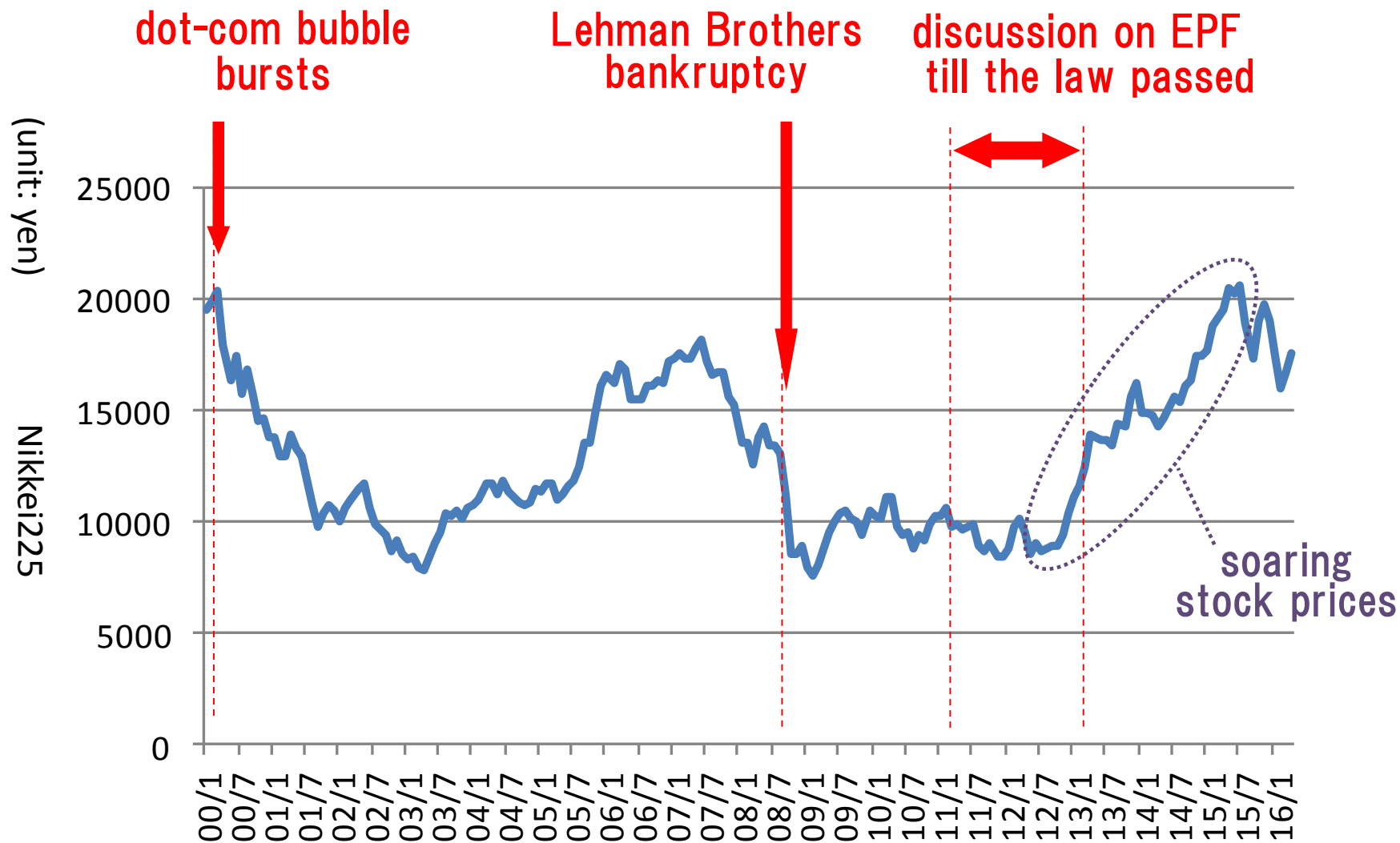


hard to estimate all factors

For simplicity, let us define

$$\begin{aligned}\text{social cost} &= \text{MinV}_{\text{old}} - \min\{ \text{MinV}_{\text{old}}, \text{MinV}_{\text{new}} \} \\ &= \text{MinV}_{\text{before}} - \text{MinV}_{\text{after}}\end{aligned}$$

# Stock price indices in Japan



# Two questions



## Question 1

How much the expenses were estimated to be?  
(at the time the bill was under discussion)

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)

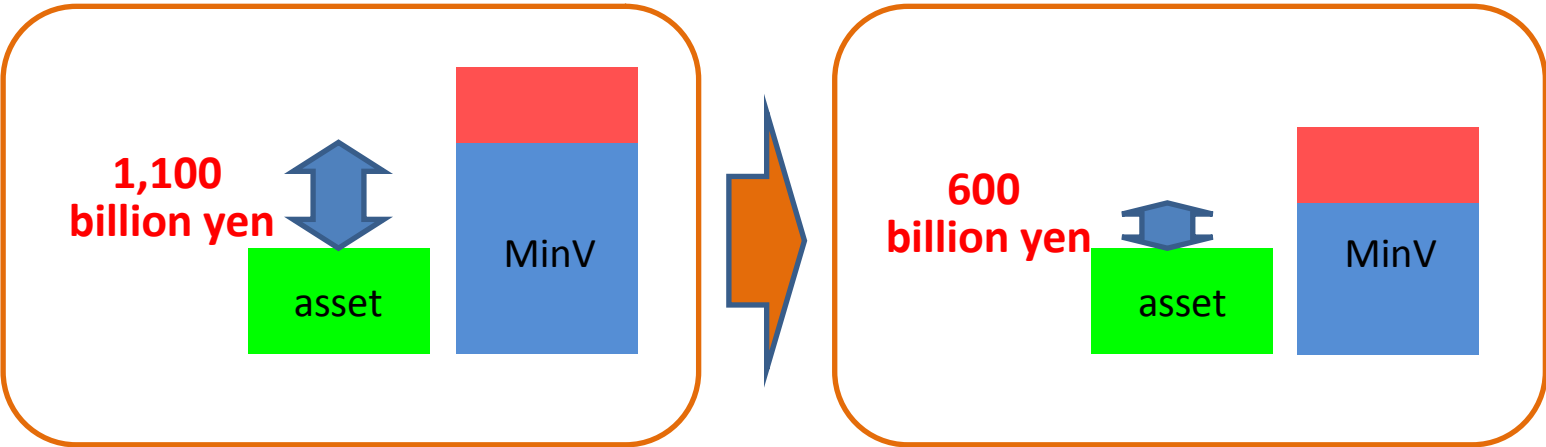
# Answer for Question 1

## Question 1

How much the expenses were estimated to be?  
(at the time the bill was under discussion)

## Answer 1

The answer is clearly written on the discussion paper.  
(The base month of this analysis is March, 2012)

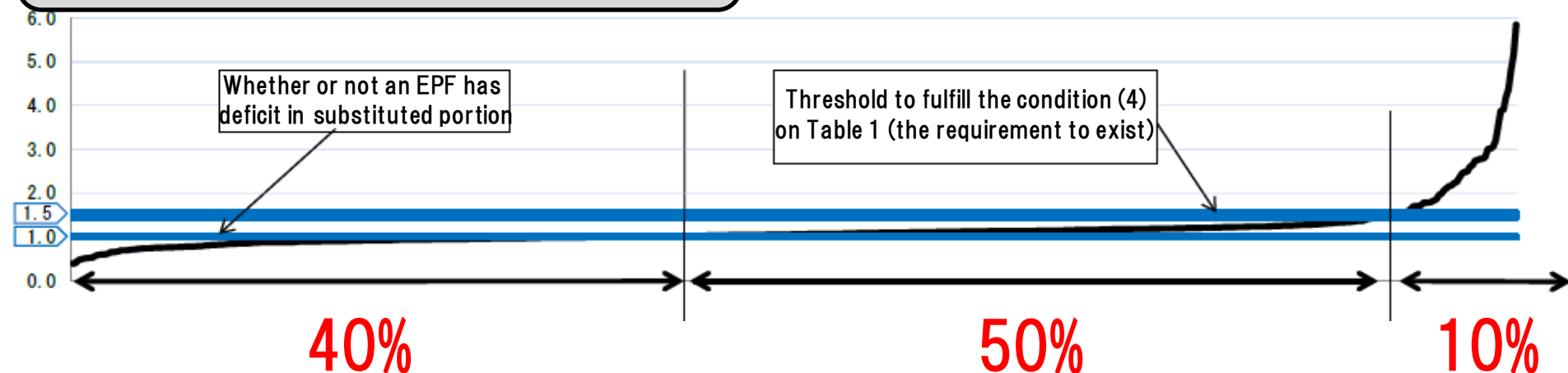


(1 US dollar = 107 yen)

# Before answering Question 2...

## Question 2

How much the ultimate expenses will be?  
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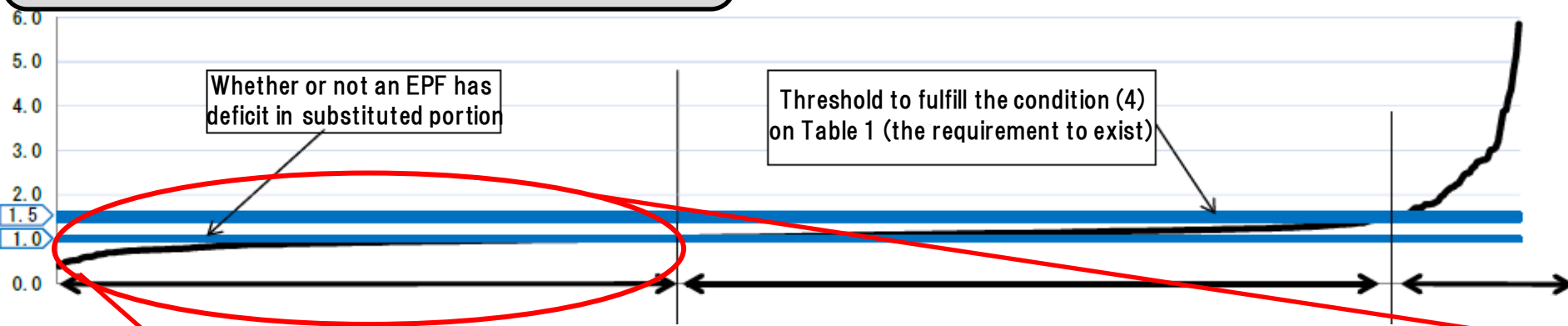
vertical axis : the ratio of the asset to MinV

horizontal axis : represents each EPF (ascending order)

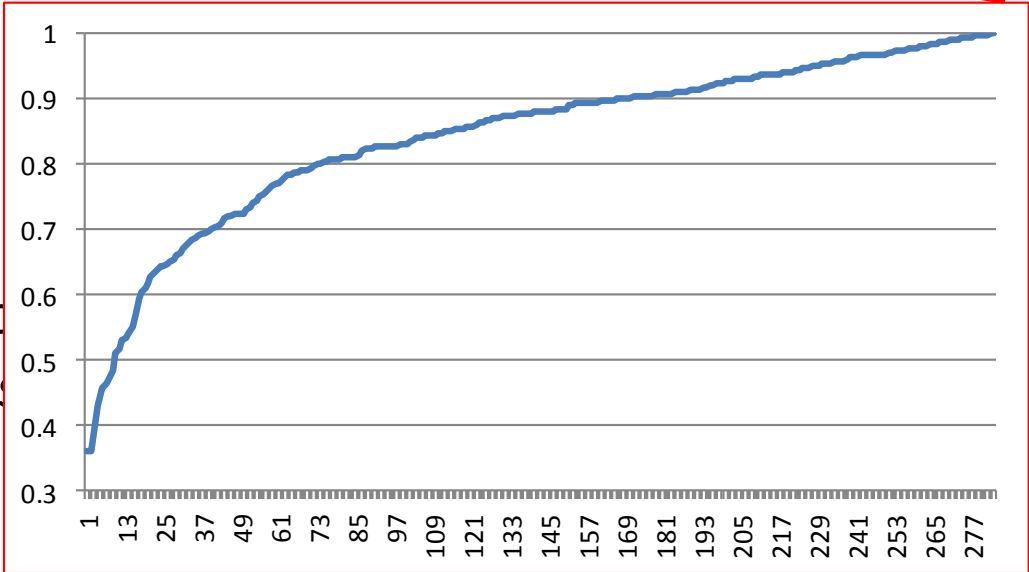
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vertical axis : the ratio of  
horizontal axis : represents

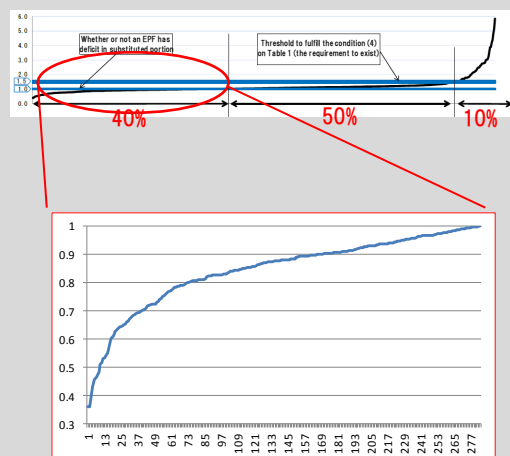




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## Question 2

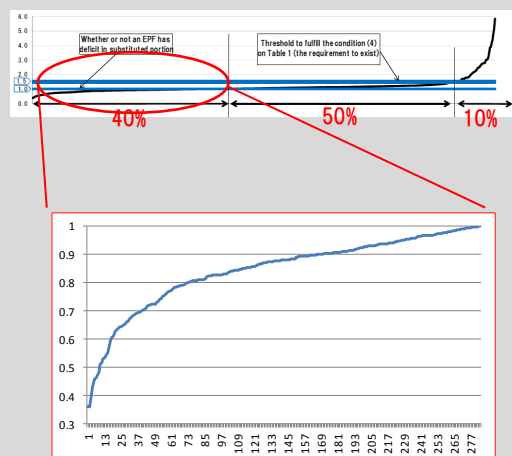
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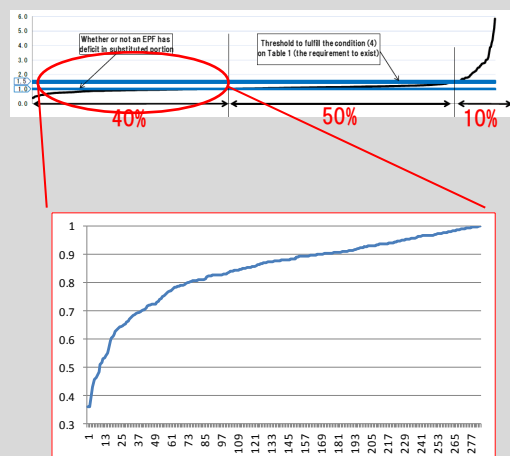
## Two suppositions

1. All EPFs have the same value of MinV.
2. The values of MinV after the provisional measure are also the same.

# Before answering Question 2...

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)

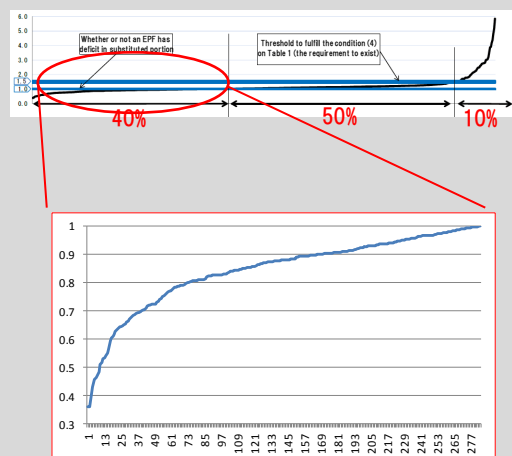


Two suppositions  
(MinV are same)

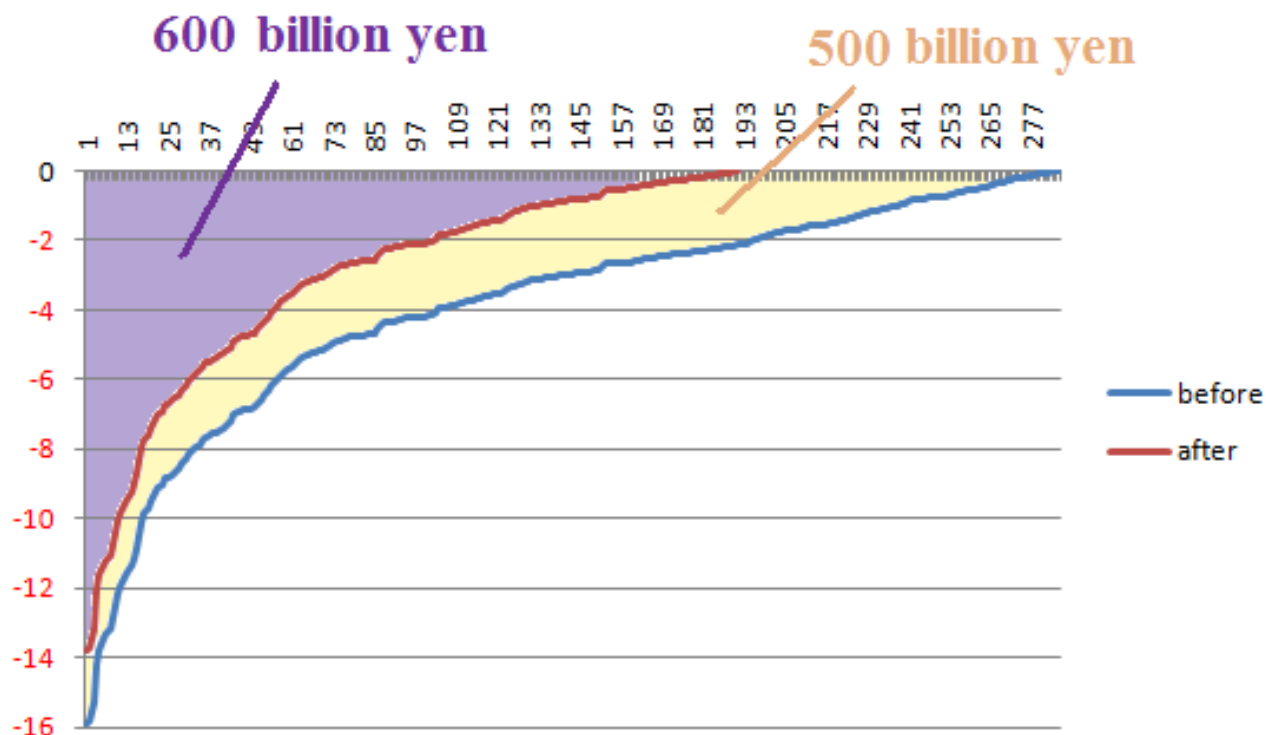
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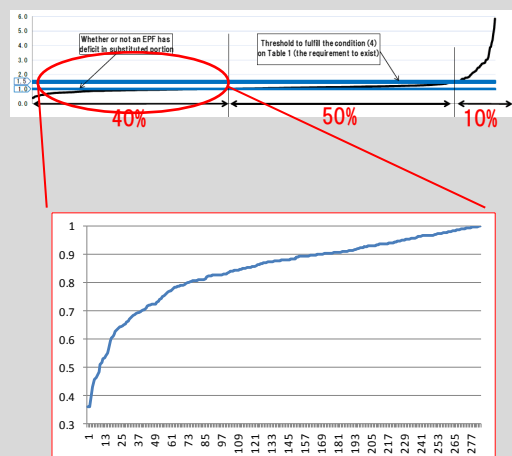


vertical axis : **the net deficit ( = MinV – asset)**  
horizontal axis : each EPF (ascending order)

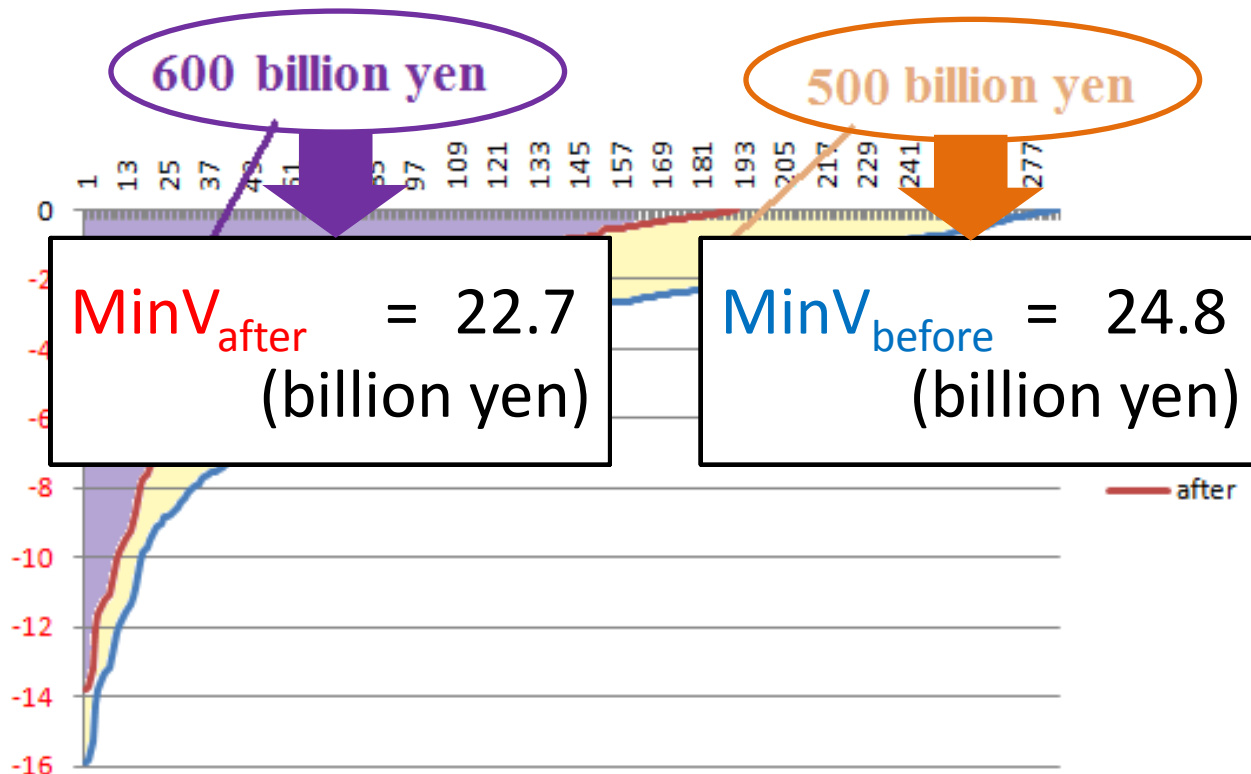
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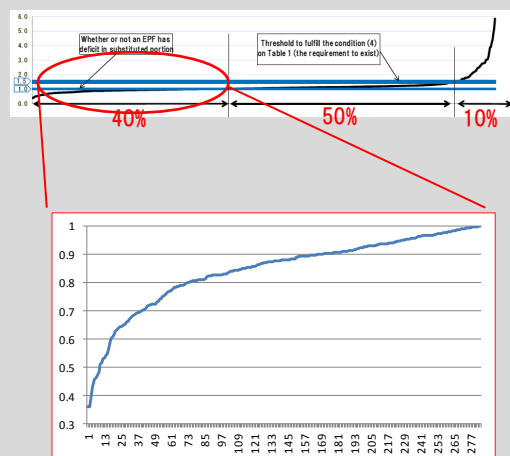


vertical axis : the net deficit ( =  $\text{MinV} - \text{asset}$  )  
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# Before answering Question 2...

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$

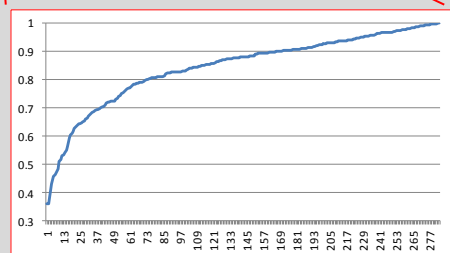
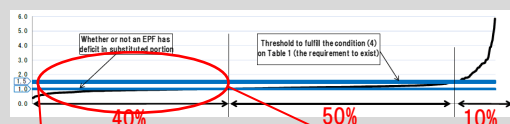
$$\text{MinV}_{\text{before}} = 24.8$$

vertical axis : the net deficit ( = MinV – asset)  
horizontal axis : each EPF (ascending order)

# Before answering Question 2...

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
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$$\text{MinV}_{\text{after}} = 22.7$$

$$\text{MinV}_{\text{before}} = 24.8$$

## Case 1

5% up



asset

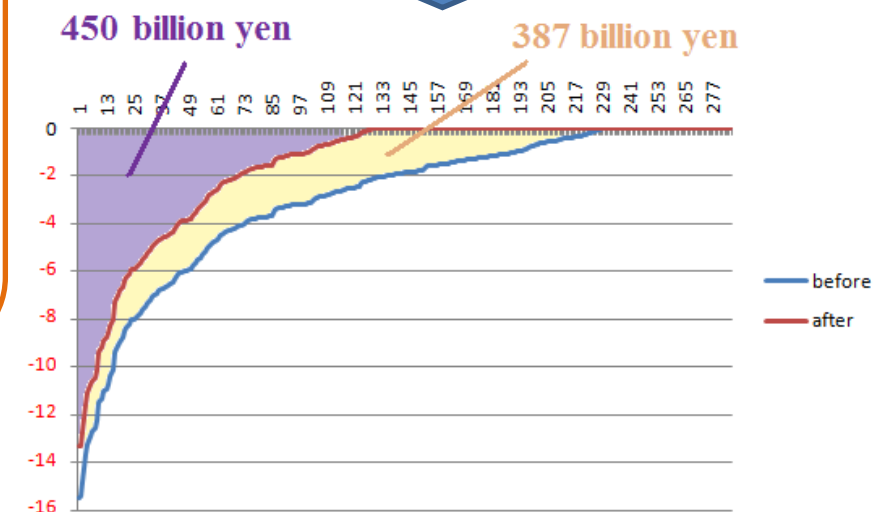
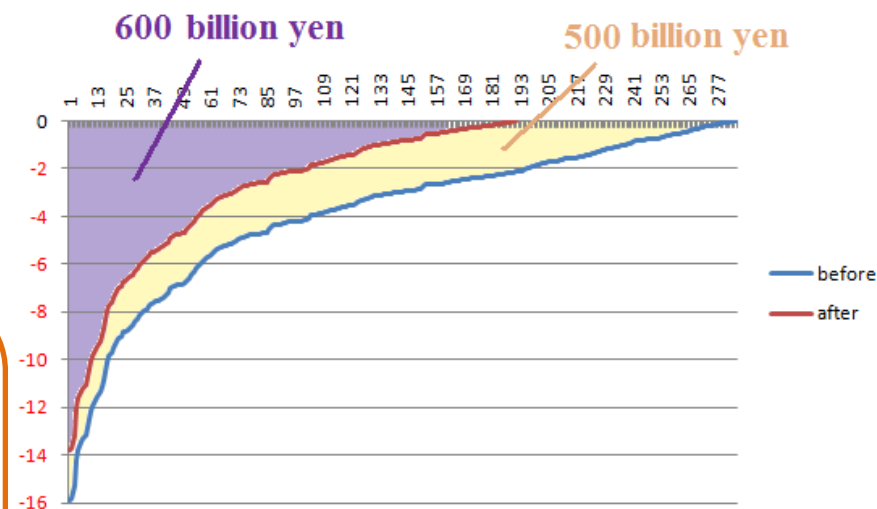
MinV  
(before)

5% up



asset

MinV  
(after)

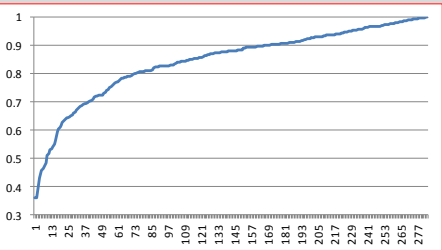
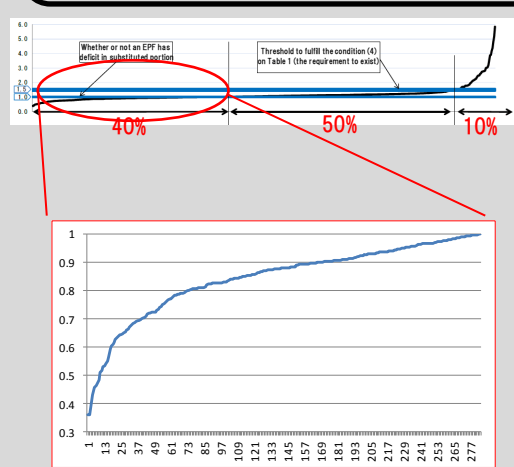


vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)

# Before answering Question 2...

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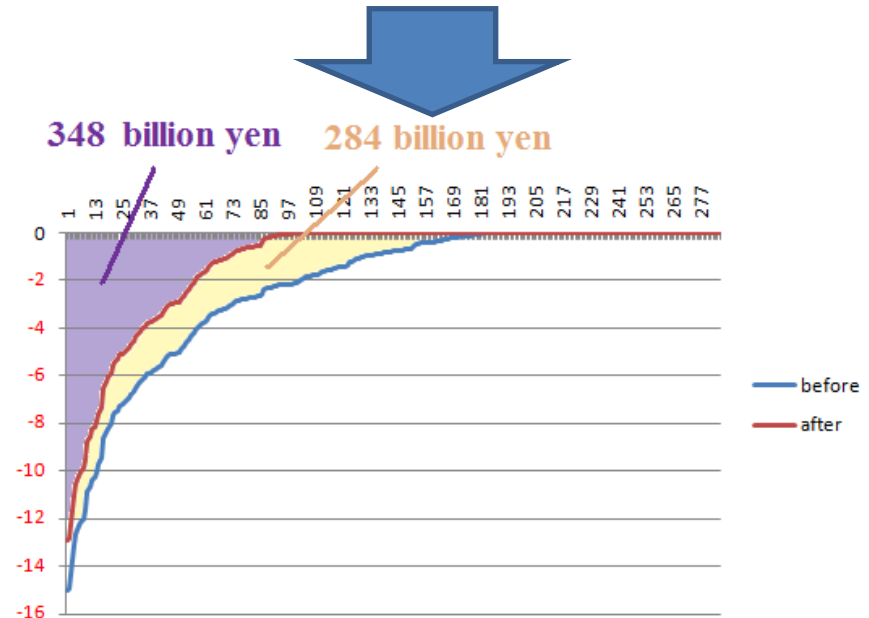
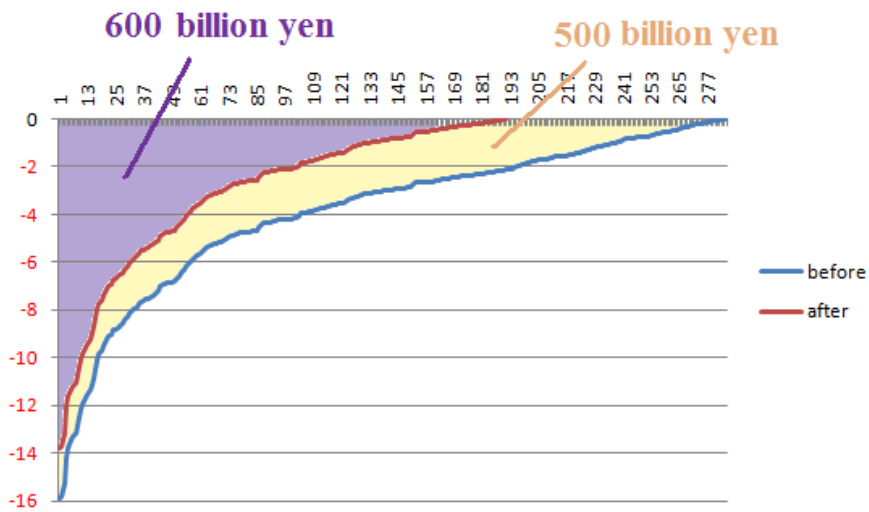
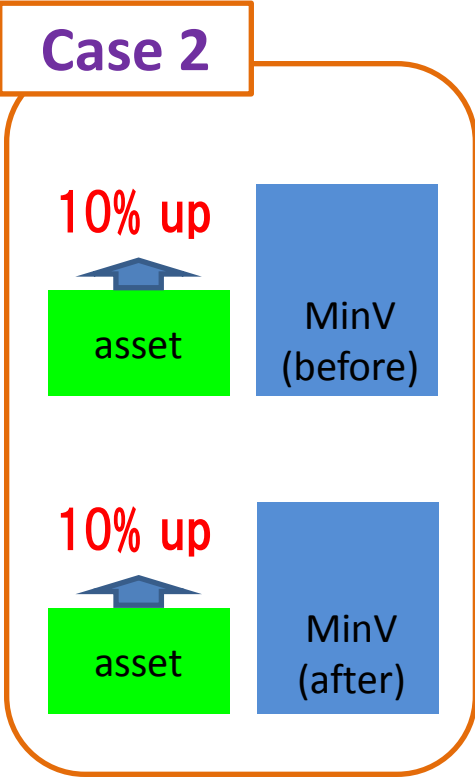
How much the ultimate expenses will be?  
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Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$
$$\text{MinV}_{\text{before}} = 24.8$$

vertical axis : the net deficit (= MinV – asset)  
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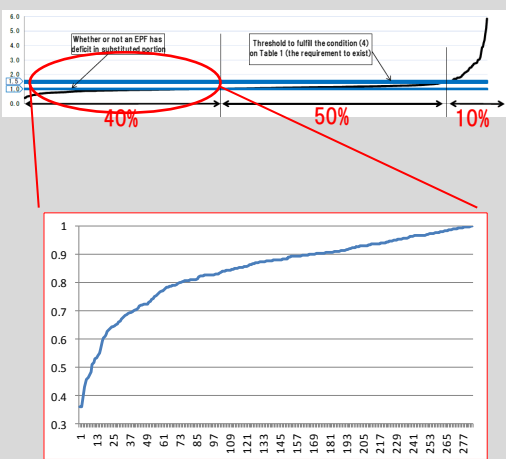




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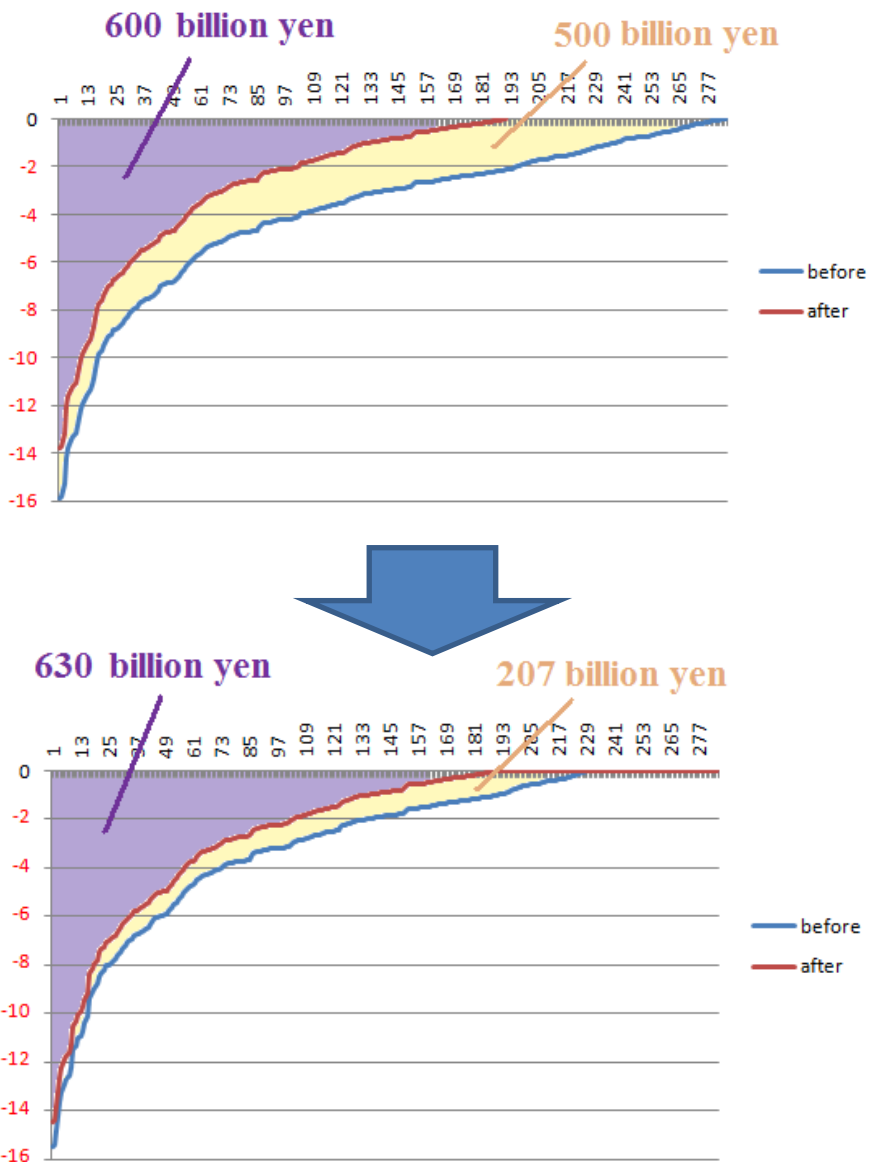
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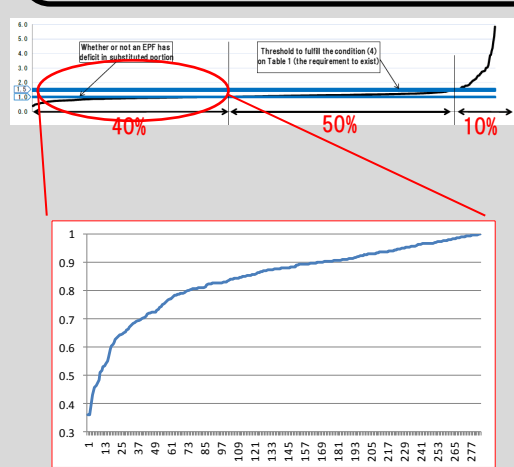
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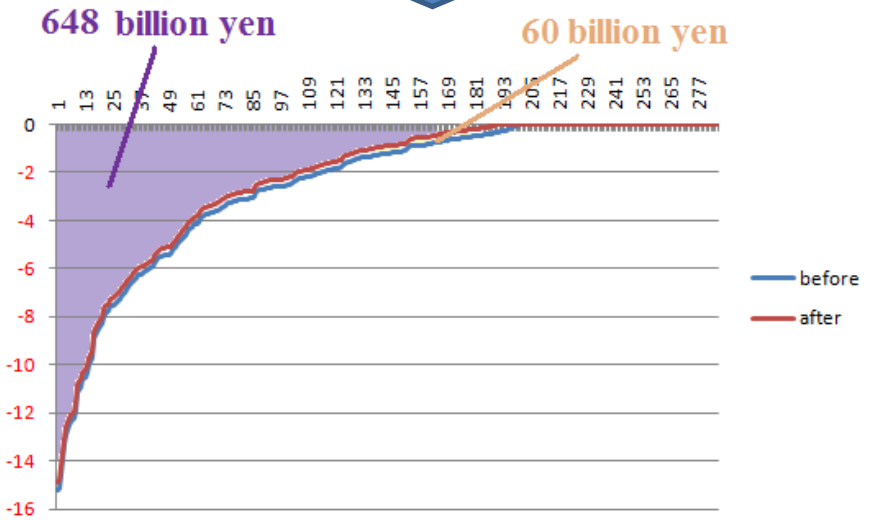
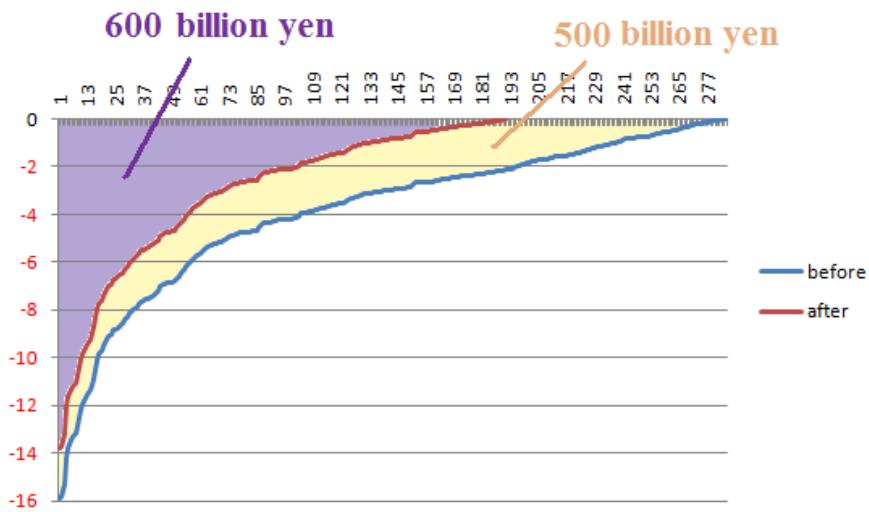
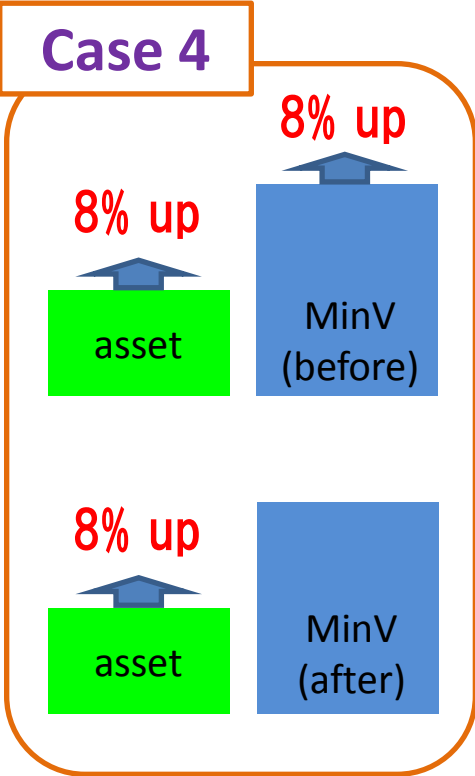
How much the ultimate expenses will be?  
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Two suppositions  
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$$\text{MinV}_{\text{before}} = 24.8$$

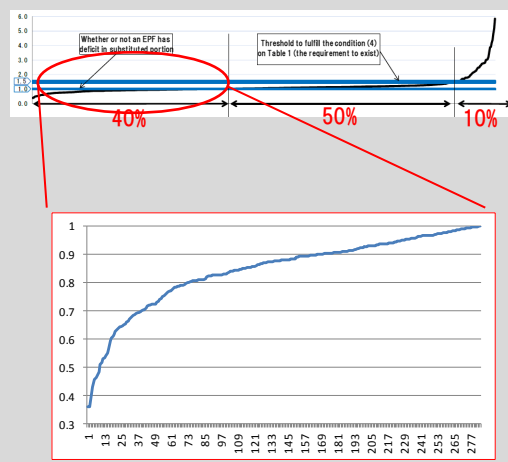
vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)



# Go back to Question 2

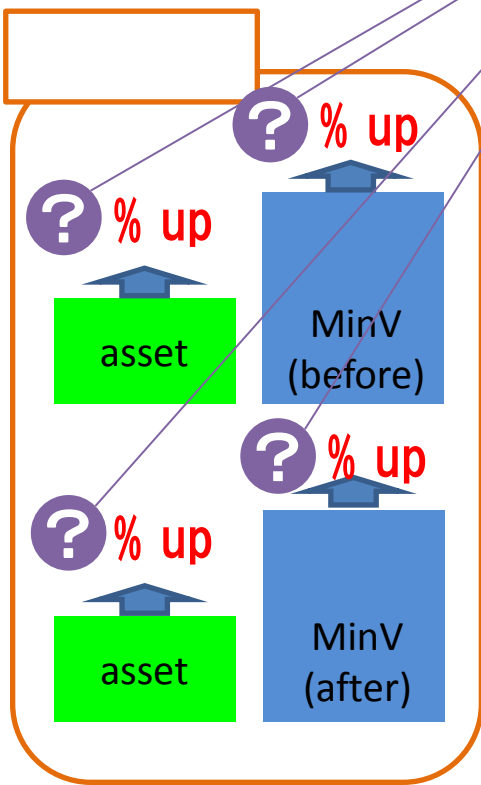
## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)

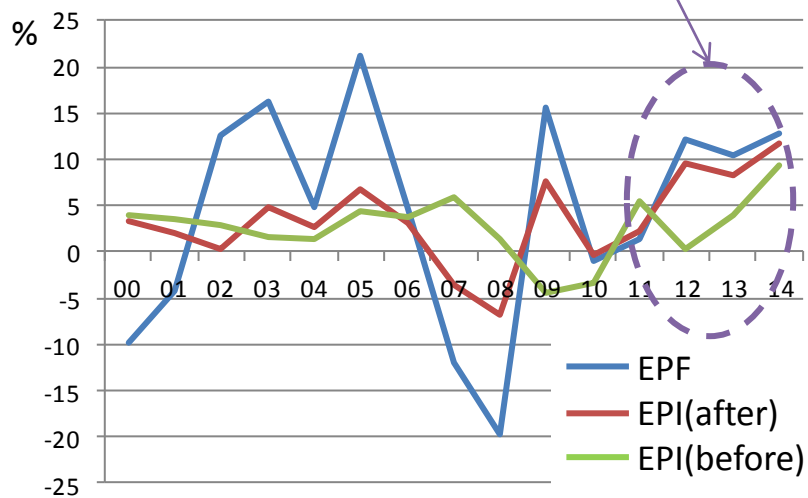


Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$
$$\text{MinV}_{\text{before}} = 24.8$$



The increase rate is replaced by the actual rate of yield.

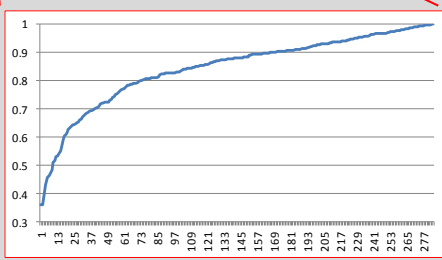
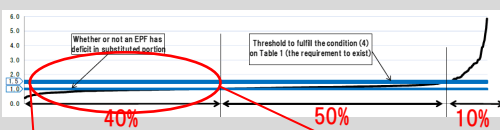


vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)

# Go back to Question 2

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$
$$\text{MinV}_{\text{before}} = 24.8$$

Termination date  
: March, 2013

12.21%

asset

9.57%

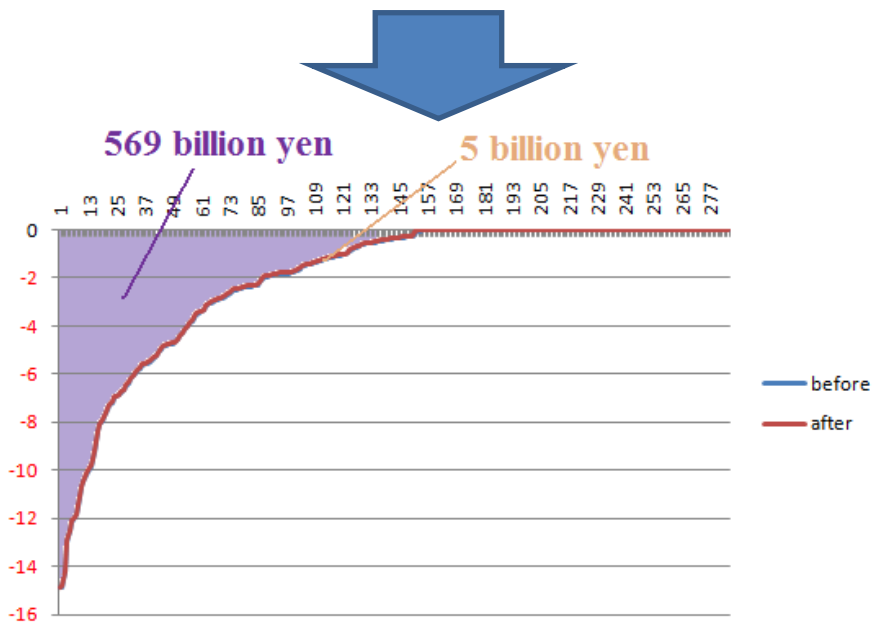
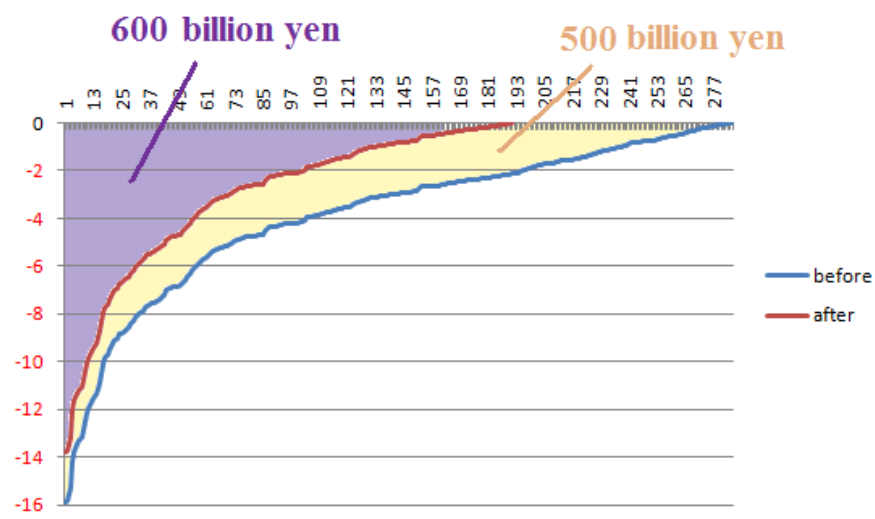
MinV  
(before)

12.21%

asset

0.34%

MinV  
(after)

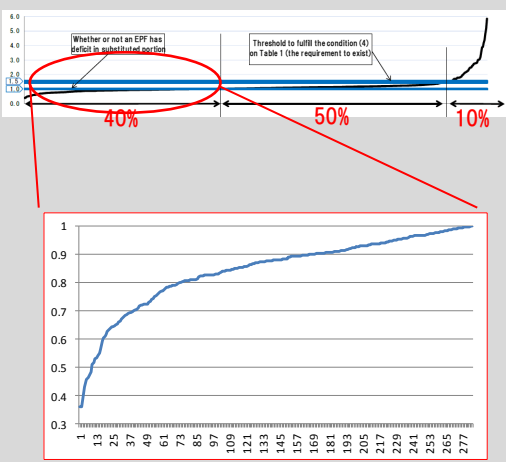


vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)

# Go back to Question 2

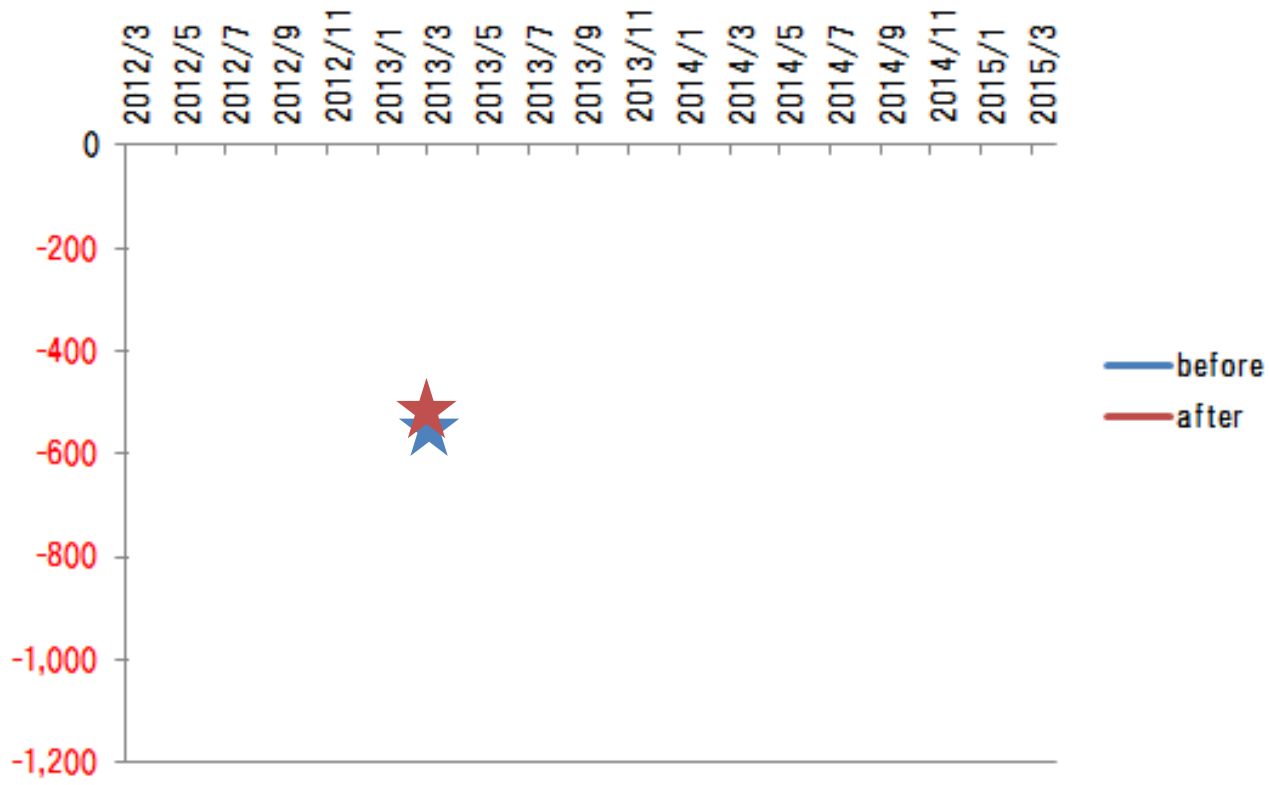
## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$
$$\text{MinV}_{\text{before}} = 24.8$$

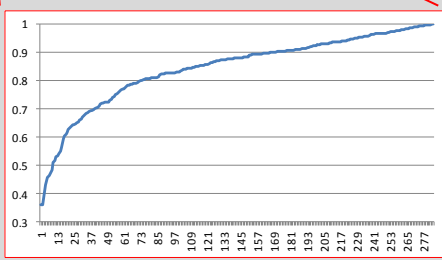
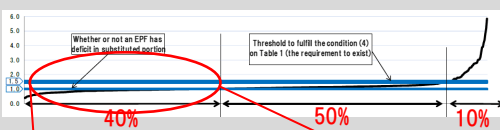


vertical axis : the net deficit ( = MinV – asset)  
horizontal axis : each EPF (ascending order)

Go back to Question 2

Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$
$$\text{MinV}_{\text{before}} = 24.8$$

Termination date  
: January, 2014

21.88%

asset

17.03%

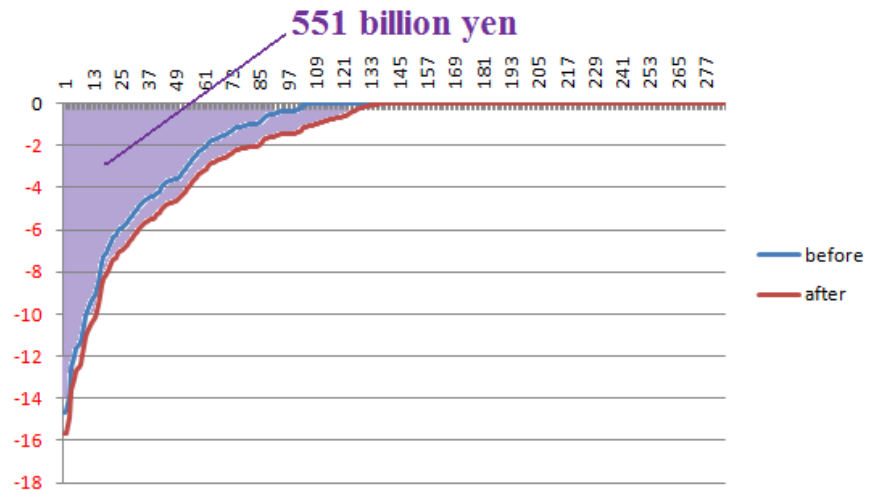
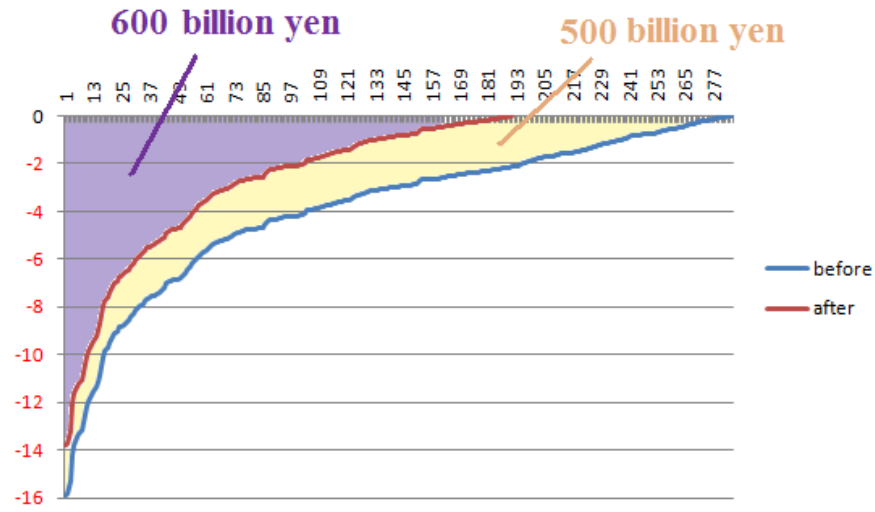
MinV  
(before)

21.88%

asset

2.75%

MinV  
(after)

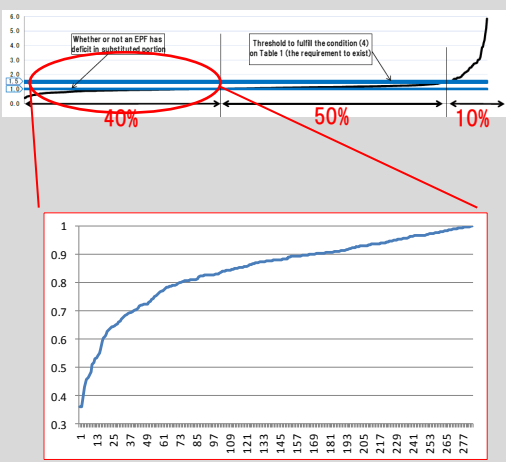


vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)

# Go back to Question 2

## Question 2

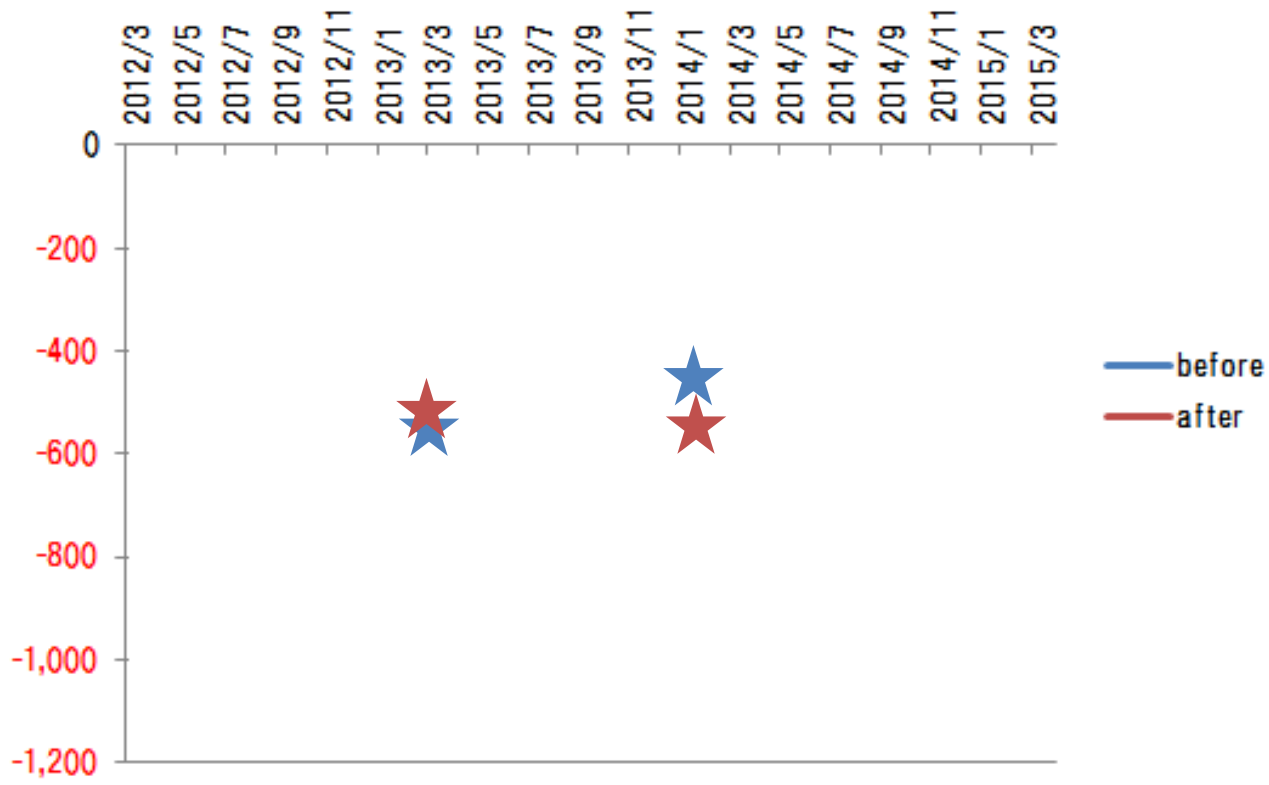
How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$\text{MinV}_{\text{after}} = 22.7$

$\text{MinV}_{\text{before}} = 24.8$

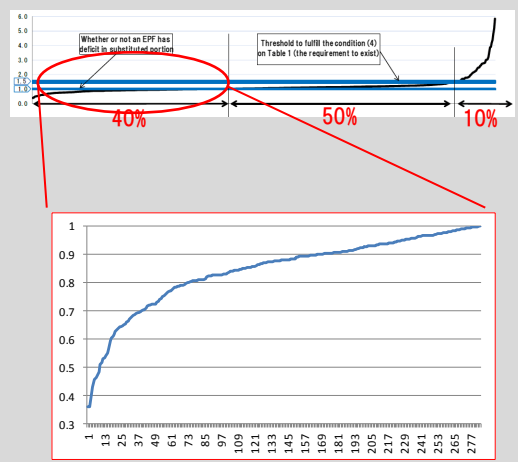


vertical axis : the net deficit ( = MinV – asset)  
horizontal axis : each EPF (ascending order)

# Go back to Question 2

## Question 2

How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

MinV<sub>after</sub>

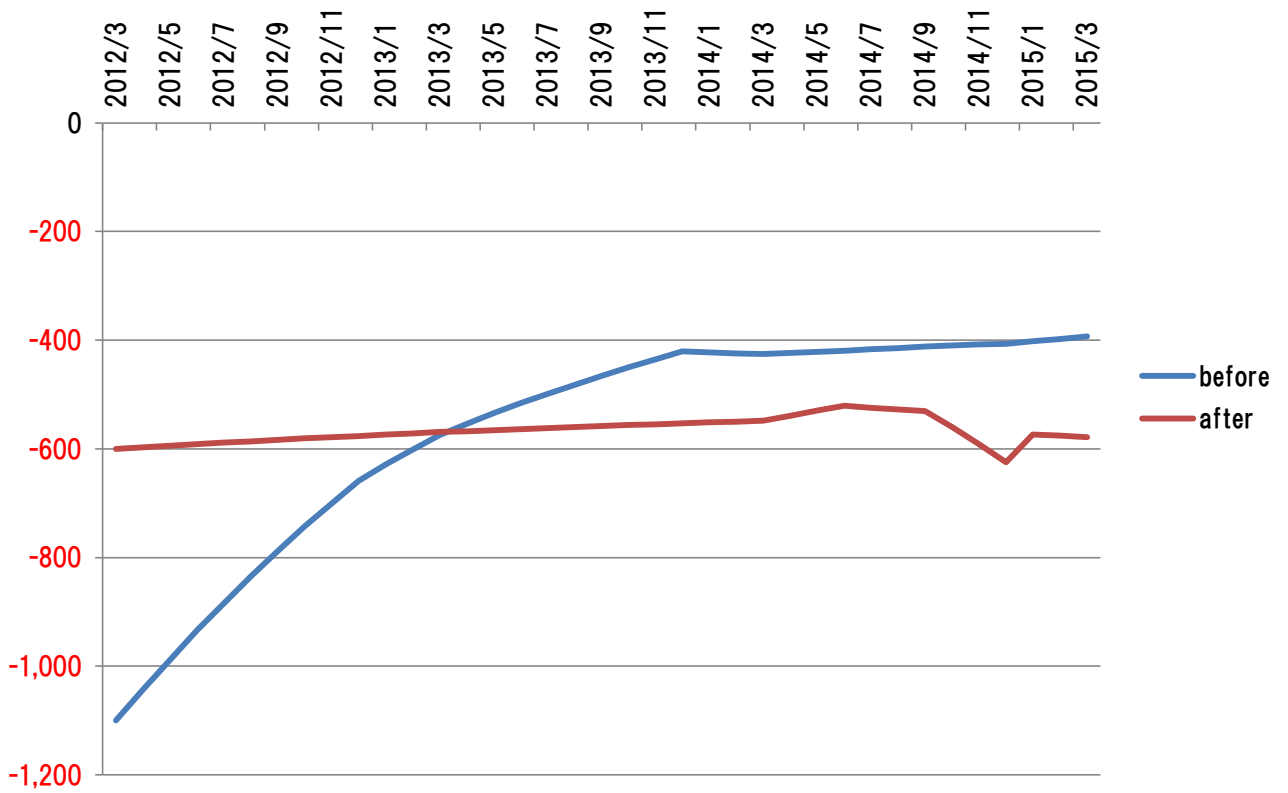
=

22.7

MinV<sub>before</sub>

=

24.8



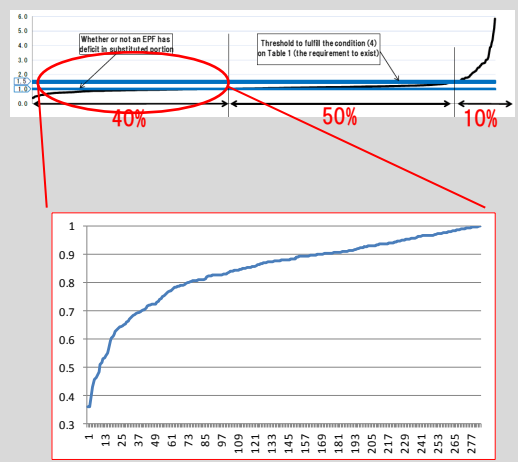
vertical axis : the net deficit (= MinV – asset)  
horizontal axis : each EPF (ascending order)



# Go back to Question 2

## Question 2

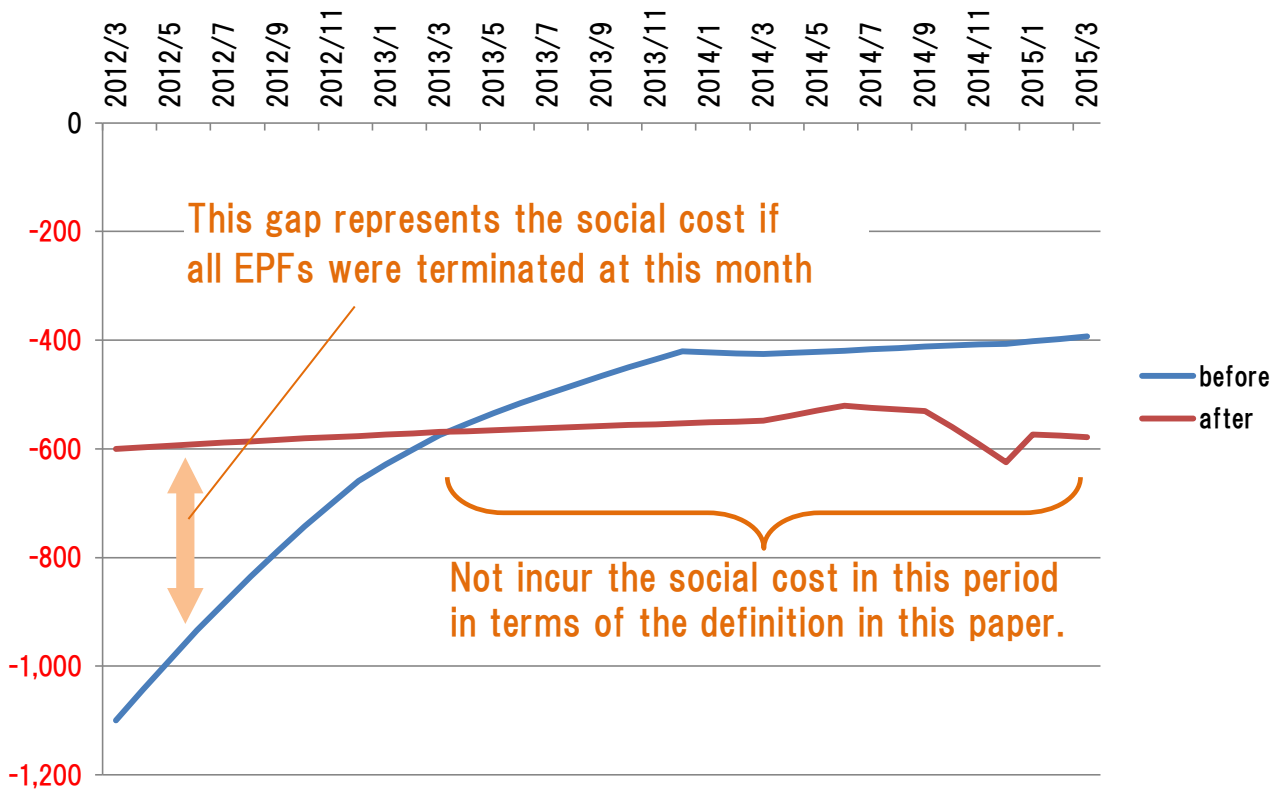
How much the ultimate expenses will be?  
(at the time all EPFs are abolished)



Two suppositions  
(MinV are same)

$$\text{MinV}_{\text{after}} = 22.7$$

$$\text{MinV}_{\text{before}} = 24.8$$



vertical axis

: the net deficit (= MinV – asset)

horizontal axis

: each EPF (ascending order)

# 5. Conclusion and further discussions.

# Conclusion

- ✓ The social cost vanishes (as long as its expected value is focused on), even though it was estimated to be as much as 500 billion yen in March, 2012.
- ✓ The strongest reason is the drastic increase in stock prices since 2013.

Thank you for listening

## Further discussion

✓ In this presentation, the social cost is defined as

$$\max \{ \text{Min}V_{\text{before}} - \text{Min}V_{\text{after}} , 0 \},$$

but some people may assert that “social cost” should be

$$\text{Min}V_{\text{after}} - \text{Min}V_{\text{before}},$$

instead. Based on this definition, either “social cost” or “social gain” is considered to have incurred for all EPFs which terminated before April, 2014.